:kaging Show Report

MAY 1956

35 CENTS

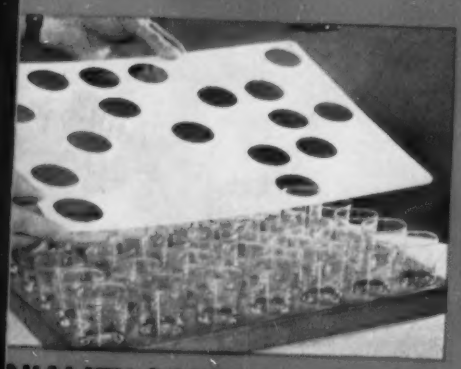
FOOD ENGINEERING

A McGRAW-HILL PUBLICATION

PERSONNEL • When does a man merit promotion? Omar records tell. p. 49

PROCESSING • Unit pits peaches at 60/min., cuts fruit and flavor loss. p. 52

PACKAGING • New broad food-wrapping applications for tough Mylar film is one highlight of big Packaging Show. p. 69 & 70



QUALITY CONTROL • Samples for aste tests 'randomized' by template. p. 54

ALSO: MAINTENANCE • SANITATION • PRODUCTS INGREDIENTS • INSTRUMENTS • MATERIALS HANDLING ENGINEERING • TRANSPORTATION

. . . See Contents Classified by Subject, Page 3 ➡

INQUIRY COUPON INSIDE BACK COVER

Doesn't Your Business Deserve the BEST SANITIZING AGENT?

insist on

GENUINE

Roccal

Reg. U. S. Pat. Off. and Canada

BRAND

SANITIZING AGENT

to do a more effective job throughout your plant!

The ORIGINAL Quaternary Ammonium Germicide

In the Food Industry, the importance of using only the best sanitizing methods cannot be over-emphasized.

In Roccal, the original quaternary ammonium germicide, the food industry is offered a sanitizing agent that is laboratory tested and controlled. The uniform quality of Roccal means uniformly good results in doing a proper sanitizing job.

Roccal is a powerful germicide. In recommended dilutions it is non-poisonous, non-irritating to the skin, virtually odorless and tasteless.

Roccal can be used for every sanitizing job in processing and packaging in the following food industries: milk, cream, ice cream, butter, cheese, egg breaking, sugar, fish, poultry, fresh frozen vegetables and fruits, meat products, cereal products, candy and beverage, wherever the product comes in contact with equipment. Also to keep walls and floors sanitary.

START USING ROCCAL TODAY—
you'll find that better sanitation is good business

Samples and Literature on Request

Sterwin Chemicals inc. 1450 Broadway, New York 18, N. Y.
Subsidiary of Sterling Drug Inc.

See Your Local Supply Dealer

USES IN FOOD INDUSTRIES

To Sanitize:

- STORAGE BINS
- FREEZING UNITS
- REFRIGERATORS
- CONVEYORS
- TANKS
- PROCESSING EQUIPMENT
- PACKAGING EQUIPMENT
- AIR CONDITIONING AND COOLING SYSTEMS
- WALLS AND FLOORS
- WASH ROOMS
- TRUCKS
- AND AS A HAND RINSE FOR PERSONNEL

Our Technical Service Department stands ready at all times to answer your questions about specific uses for ROCCAL

MAY 1956

Volume 28 Number 5

Contents Copyright 1956 By McGraw-Hill Publishing Co., Inc.. 330 W. 42nd St., New York 36, N. Y. (All Rights Reserved)

ABC ABP

FOOD ENGINEERING

FEATURE ARTICLES

		Baking	Beverages	Cereals	Confectionery	Dairy	Fruits, Vegetables	Meats, Fish	Other Foods
Spotlight on 69 Latest Packaging Units Eleven photo pages, including: 8 Fillers . . . 3 Bundlers, Strapper . . . 6 Labelers . . . 5 Pouch Formers, Fillers . . . 4 Cappers . . . 3 Cartoning Units . . . 7 Coders, Imprinters . . . Bottle Cleaner, Bag Former . . . 7 Baggers and Bag Opener . . . 4 Wrappers . . . 5 Types of Sealers . . . 4 Counters . . . 3 Material Handlers . . . 1 Caser, 5 Miscellaneous Units	70	•	•	•	•	•	•	•	•
Omar's Top Brass Gets Down to "Pay-Off Basics" in Merit Rating	49	•	•	•	•	•	•	•	•
New Machines and Techniques Cut Fruit Loss, Raise Quality	52						•		
Here's SQC Technique for Upping a Food's Taste-Uniformity	54	•	•	•	•	•	•	•	•
Irradiation and Antibiotics May Team Up to Preserve Meat	57						•	•	
Physicists "Put Finger" on Promising Food Techniques	58	•	•	•	•	•	•	•	•
Foods in Patty Form Build Acceptance	60							•	
Controlled Cooling: Key to Quality Fish Sticks	61			•				•	
How Automation Techniques Can Robotize Mayonnaise, Dressings	62								•
Automatic Elevator Keeps Crowns Feeding to Machine	65	•	•	•	•	•	•	•	•
Steel-Belt Conveyors: When to Use Them . . How to Maintain Them	66	•	•	•	•	•	•	•	•
Mylar Breaks Barriers to Wide Application	69	•	•	•	•	•	•	•	•
Propose Irradiation of Foods in Power Plants	85	•	•	•	•	•	•	•	•
Dairymen Target Concentrated Milk, Frozen Desserts, Problems	86					•			
Gets 40% More Flavor in Improved Vanilla Process	91	•	•	•	•	•			
Lower-Cost Process Stops Wine Sediment	93		•				•		
Old Sage Episode—What Should You Teach Foremen?	94	•	•	•	•	•	•	•	•
Outstanding Cling Peach Process (Foldout Flowsheet)	104						•		

INDUSTRY BRANCHES To Which Articles Apply

DEPARTMENTS

Practical Ideas	5	Advances in Technology	163	Schedule of Events	203
Letters to the Editor	99	Questions & Answers	181	Recent Inventions	209
In Behalf of Progress	102	Useful New Books	192	Men & Companies	212
Messages to Industry	113	Keeping Up With Field	197	Just Off the Press	218
New Equipment & Supplies	117	Hors d'Oeuvres	199	Advertisers' Index	234
New Packages & Products	150	Briefly	201	Readers' Service	back page

CONTENTS CLASSIFIED BY SUBJECT

SANITATION: Irradiation, Antibiotics Preserve Meat, 57; Irradiation in Power Plants, 85; also 52, 54, 58, 70, 123, 125, 129, 139.

PLANT ENGINEERING: New Techniques Cut Fruit Loss, 52; Keeps Crowns Feeding, 65; Steel-Belt Conveyors, 66; Packaging Show Report, 70; also 5-13, 58-62, 85, 104, 117, 119, 127, 135, 163, 167-8, 198, 209.

PROCESSING: New Techniques Cut Fruit Losses, 52; Quality Fish Sticks, 61; Robotized Dressing Manufacture, 62; Stops Wine Sediment, 93; also 54, 58, 60, 66, 70, 85, 91, 104, 119, 163-4, 210.

MATERIALS HANDLING: Keeps Crowns Feeding, 65; Steel-Belt Conveyors, 66; also 13, 52, 61, 69, 70, 104, 118-27, 132, 135, 167.

PACKAGING: Mylar Breaks Barriers, 69; Packaging Show Report, 70; also 7, 13, 52, 58, 61, 65, 104, 150, 121, 127, 132, 163, 210.

PERSONNEL: Merit Rating Pays Off, 49; Ole Sage, 94; also 7, 13, 54, 197.

QUALITY CONTROL: SQC Ups Uniformity, 54; Irradiation, Antibiotics Preserve Meat, 57; Quality Fish Sticks, 61; also 7, 52, 58, 60, 62, 70, 85, 86, 93, 104, 118, 136, 163-4, 171-2, 175.

PRODUCTS: Foods in Patty Form, 60; Dairy Conference, 86; Improved Vanilla, 91; also 52, 54, 57, 61-2, 93, 104, 163, 172, 209

INGREDIENTS: Robotized Dressing Manufacture, 62; Dairy Conference, 86; also 52, 60-1, 91, 163.

INSTRUMENTS: Physicists Point Out Techniques, 58; also 5, 61-2, 70, 85, 119, 125.

MAINTENANCE: Steel-Belt Conveyors, 66; also 9, 11, 117, 123, 128, 139-43.

TRANSPORTATION: 86, 123, 131.

FE STAFF

PUBLISHER *Edwin D. Fowle*

EDITOR *Frank K. Lawler*

SENIOR ASSOCIATE EDITOR *A. V. Gemmill*

SENIOR ASSOCIATE EDITOR *C. R. Havighorst* SAN FRANCISCO

MANAGING EDITOR *Herb Powell*

ASSOCIATE EDITOR *John V. Ziemba* CHICAGO

ASSOCIATE EDITOR *Ivan C. Miller*

ASSISTANT EDITOR *Leonard Trauberman*

ASSISTANT EDITOR *Robert J. Kelsey*

ART EDITOR *Edward P. McGrath*

EDITORIAL ASSISTANT *Sally Miller*

CONSULTING EDITORS *S. D. Kirkpatrick, R. S. McBride*

WASHINGTON *G. B. Bryant, Jr.*

WORLD NEWS *John R. Wilhelm*

ECONOMIC DEPARTMENT *Dexter M. Keezer*

SALES MANAGER *G. E. Riddell*

New!

BAUSCH & LOMB
LOAD
LIGHT
LOOK
REFRACTOMETER

ABBE-3L

Just LOAD-LIGHT-LOOK!

Top accuracy refractometry in seconds!

SEE FOR YOURSELF IN FREE LABORATORY DEMONSTRATION

Write today for demonstration in your own lab, at your convenience... and for informative Catalog D-280. Bausch & Lomb Optical Co., 60305 St. Paul Street, Rochester 2, New York.

EASIEST OPERATION EVER! Front, horizontal loading. Fixed prism assembly... wipes clean in a wink. DUO-SPEED control knob... rapid scanning and fine line setting at the touch of a finger.

FASTEST, TOP ACCURACY READINGS! New instant-reading precision scale, graduated directly to .0005. Quick, easy estimates to .0001.

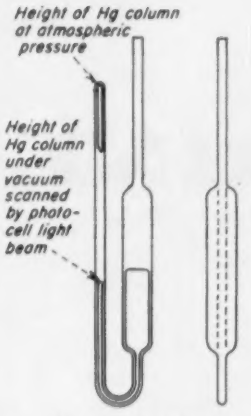
ASSURES FULL-WORKING-DAY COMFORT! Eyepiece at convenient height and angle for relaxed sitting-position observation; DUO-SPEED control knob and line-scale switch in low position for hand-at-rest operation.

PLUS... many other new features and new performance advantages setting the new standard for high-speed, high-accuracy refractometry. Find out now how they can ease your work load.

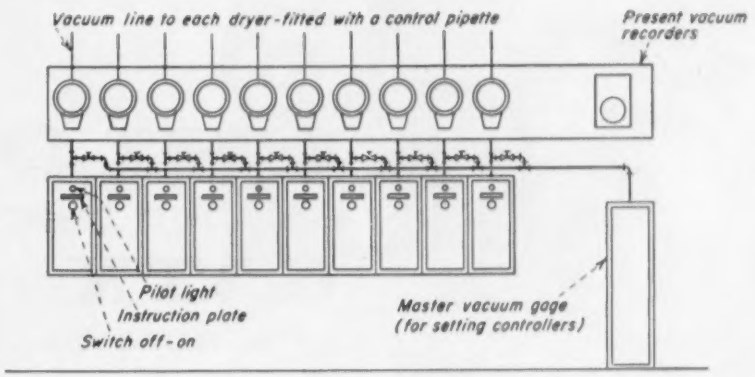
BAUSCH & LOMB
SINCE 1853

America's only complete optical source... from glass to finished product.

PRACTICAL IDEAS



NO. 1 - CONTROL PIPETTE


Vacuum line to each dryer - fitted with a control pipette
Present vacuum recorders
Pilot light
Instruction plate
Switch off - on
Master vacuum gage (for setting controllers)

NO. 2 - FRONT ELEVATION - VACUUM CONTROLLER PANEL

Make Own Vacuum Controls

The Instant Postum manufacturing process requires use of steam-heated vacuum drum dryers to evaporate last traces of moisture.

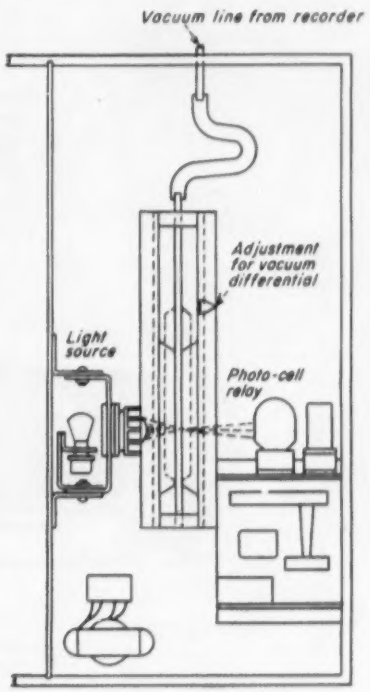
So critical is this process that for several years we made a series of tests to determine optimum conditions for temperature, vacuum, and production rates. We found that it was comparatively easy to control temperatures and production rates, but we were baffled by the problem of developing suitable controls for vacuum conditions.

Vacuum is maintained on each dryer unit by a two-stage steam ejector. It had always been our practice to maintain as high a vac as possible with the existing system, and under such conditions the vacuum developed was extremely sensitive to barometric pressure. Normally, we could hold a vacuum 1.5 in. to 2.5 in. Hg below the barometer reading.

Observations at the time of our tests, however, revealed that, contrary to previous knowledge, lower vacuum drying conditions increased production. In fact, with a vac differential as great as 5 in. Hg below barometric pressure, a standard product could be produced. But to maintain the lower vacuum condition, it was necessary to admit air through a manually-controlled valve. Naturally, it was impossible to maintain, uniformly, optimum vacuum under these conditions.

Vacuum controllers are very sensitive instruments and, as a consequence, expensive. We found that it would be quite costly to equip our ten vacuum drum dryers. Since our control requirements did not justify the extreme sensitivity built into those instruments on the market, we decided to experiment with "home-made" devices.

Working with representatives from our instrument and



NO. 3 - PHOTO RELAY SCANNER

FOOD ENGINEERING

(Formerly Food Industries)

May 1956 Vol. 28, No. 5

Published monthly by the McGraw-Hill Publishing Co., Inc.

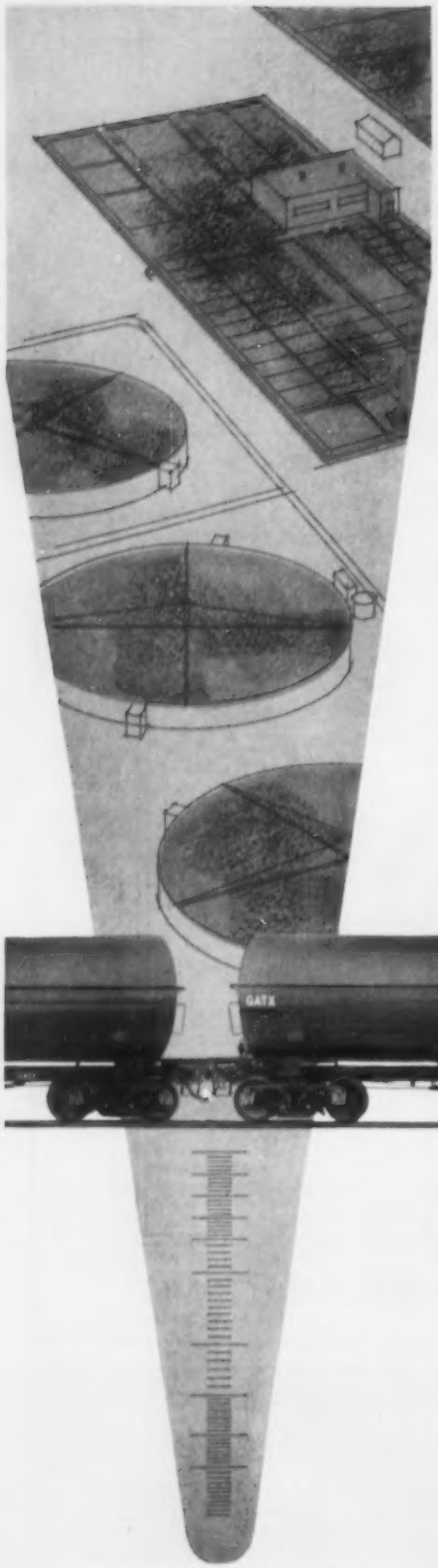
Executive, Editorial, Advertising, and Subscription Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office, 99-129 N. Broadway, Albany 1, N. Y.; Second class mail privileges authorized at Post Office at Albany, N. Y.

Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; J. E. Blackburn, Jr., Vice-President and Circulation Director.

For subscriptions, write to Food Engineering Subscription Service, 330 W. 42nd St., New York 36, N. Y. Order must indicate company and position. Allow one month for change of address.

Subscriptions are solicited only from the executives, engineers, and technologists in food processing plants.

Single copies 35¢. Subscription rates—U. S. and possessions and Canada, $2 for 1 yr., $3 for two yr., $4 for 3 yr. Other Western Hemisphere countries and Philippines, $10 for 1 yr., $16 for 2 yr., $20 for 3 yr. All other countries, $15 for 1 yr., $25 for 2 yr., $30 for 3 yr.

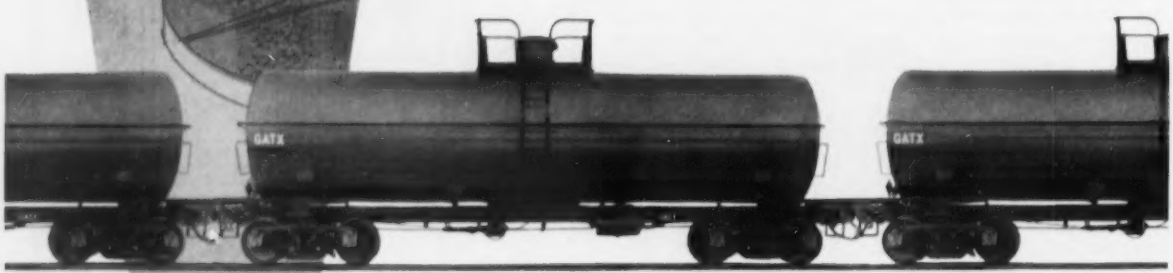


CHLORINE

shipped best in special GATX pressure tank cars

GATX pressure cars for chlorine do double duty. They not only serve as the shipping container, but as the storage tank as well. Accurate controls built into these cars permit users to unload the chlorine as it's needed. For greater flexibility, General American offers four sizes of cars—55-ton, 30-ton, 16-ton and multiple-unit cars carrying fifteen one-ton containers.

There's a GATX tank car that's built or can be built to meet your bulk liquid shipping needs. You can choose from over 200 types in the fleet of 48,000 cars designed, built and operated by General American. General American's 38 repair shops service these cars quickly and efficiently for you. For the *right* tank car for your product, write or call your nearby General American district office.



typical products successfully shipped in GATX pressure tank cars • *Anhydrous Ammonia* • *Butane* • *Propane* • *Ethylene Oxide* • *Propylene Oxide* • *Vinyl Chloride* • *Methyl Chloride* • *Ethyl Chloride* • *Chlorine* • *Carbon Dioxide*

features of GATX pressure tank cars*

All-Welded Tank, Jacket and Underframe • *Flued-Dome Construction*** • *Safety Dome Platform (Available)* • *Painting to Specification (Available)* • *Insulation* • *Specially Designed Fittings (Available)*

**Standard equipment unless otherwise noted.*

***The one-piece flued-dome saddle was designed and pioneered by General American as early as 1938.

GATX GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street • Chicago 90, Illinois

electrical departments and the control laboratory, we developed a device that would control vacuum within the limits of our requirements. Under operating conditions, this device has proved to be satisfactory over an extended period of time.

Here's how the device works: An ordinary laboratory pipette was sealed on one end and bent in a U-shape (see No. 1 in sketches). Because the device would operate as an absolute pressure column rather than barometric, it was necessary to see that all air was excluded from the closed end—accomplished by heating the mercury to the boiling point, thus driving off entrapped air. The glass tube was then pumped to as near a perfect vacuum as possible. The heated mercury was introduced until the closed end of the pipette contained no voids.

Original dryer installation included a vacuum recorder on each drum. The open end of the mercury pipette was connected into the vac line to each recorder (No. 2 in sketches) and a photo cell relay (No. 3 in sketches) was positioned to scan the top of the mercury column in the closed end of the pipette.

An increase in vacuum beyond the instrument setting lowers the mercury column, causing the photo-relay to operate. The photo-relay then opens a solenoid-operated valve, admitting atmospheric air until the desired vacuum, as set by the mercury column, is re-established.

An accuracy of 0.2 in. Hg is now regularly obtained, at a cost for the ten-unit installation approximating the price of one commercial unit.—*Technical Bulletin, General Foods Corp.*

Pockets in Food-Plant Garments

In many types of food plants it is desirable to have employees wear pocketless uniforms or clothing. This avoids the risk of pocket contents falling into the products.

However, it is necessary, in some instances, for certain items to be carried on the person. So here is a way to do it without endangering products:

Attach pockets, patch-fashion, to the *inside* of the garment (see sketch). Then the chance that things will ever fall out of them is much reduced. And any items that do escape will end up on the floor, never in the product.

It will also be found helpful if these inside pockets are fabricated from waterproof material to protect pocket contents from body moisture.—*J. W. Felsch, General Manager, Barron Co-op Creamery, Barron, Wis.*

Speeds Tuck-Top Case Closing

In the interest of efficiency and saving space, the conveyor leading to our tuck-top case closer was relatively short. Major purpose of this conveyor is for inspection of contents of cases, to see that each case is filled properly. This can be done in a few seconds time.

Automatic case closers for this type of solid-fiber, returnable case are usually equipped with converging angle lead-in rods, arranged so they will gradually close the tuck-top before the case moves under the plough.

But, operating at normal speed of 850 cases/hour, this conventional arrangement of rods for partially closing cases was not fast enough. Cases tended to pile up on the short conveyor.

So, to speed up this preliminary closing operation, we designed arc-ed rods (see arrow) to replace the angle lead-in rods. As cases are conveyed between them, they quickly flip the tuck-top lids to a partially-closed position, whereupon the plough and subsequent pressure rollers can finish the closing operation.—*Falstaff Brewing Corp., San Jose, Calif.*

Check on Addition of Vitamins

In these days of fortifying milk with vitamin D, and flour or cornmeal with B-vitamins and minerals, there are all too many cases where the employee or employees responsible have "sheer forgot" to put them in.

In examining several thousand samples of vitamin-D milk for vitamin potency, we have found about 3% of them are totally negative. This leads a company into trouble with health departments.

Obviously, in these sample cases no vitamins had been added. Excuses are many. Usually it is forgetfulness on the part of a non-technical employee.

As for what to do about it, I have made the following suggestion to many milk dealers and other food manufacturers, and results have been very satisfactory:

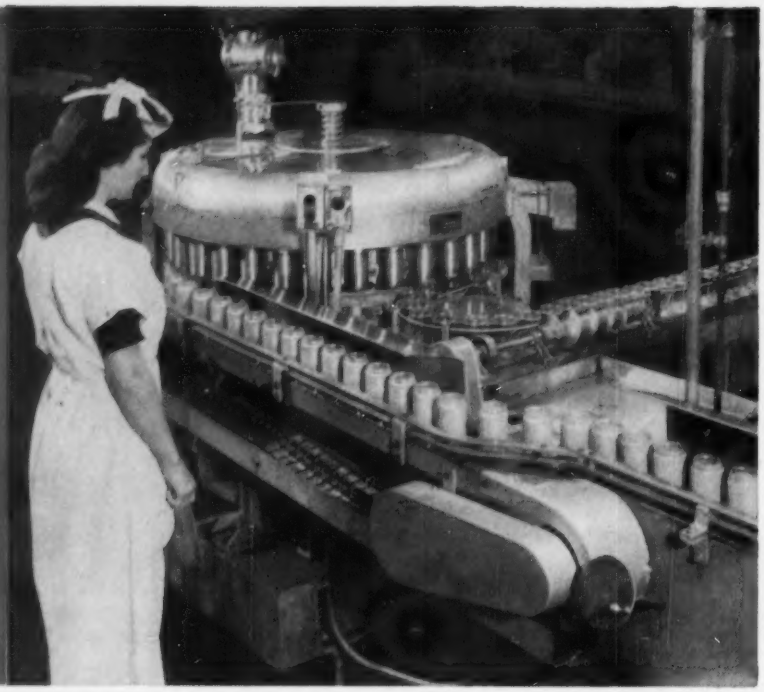
Keep vitamin supply in office or laboratory—not in processing rooms. Thus, it will be necessary for the foreman, or other responsible individual, to make some effort to pick up the vial or tablets each day.

He should be made to sign a register when he takes

fmc

M&S

fillers

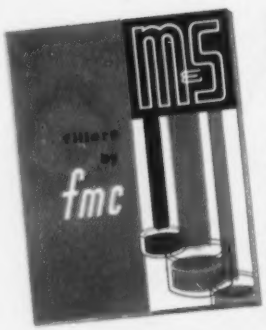


Performance-proved...unsurpassed for speed, accuracy, and range of products handled!

This is why quality-built M & S Fillers are truly the "Standard of the Filling Industry." They provide an unbeatable 3-way combination of the most *accurate* measurement at *highest* speeds on the *widest range* of liquid, semi-liquid, and heavy semi-solid products!

M & S Fillers are easily adapted to fill all cans, jars, and even cartons. Speeds are limited only by the closer or capper. Endurance is a by-word with M & S Fillers: each of the eight basic models is precision-engineered for heavy duty, long life operation. Servicing is made easy and simple: all checking, lubrication and adjustment points are handy to reach. The fine quality and performance of M & S Fillers is assured through the use of special alloys and rigid factory inspection. And the exclusive FMC "No-can, No-fill" feature prevents spilling and waste.

By all comparisons, these are the finest fillers made—designed and built to perform better, longer and at lower cost.



New Filler Bulletin Just Off the Press!

This new FMC Bulletin completely describes the eight basic M & S Fillers in this famous line. Specifications and illustrations of all models are included, along with detailed explanations of accuracy, operation, and construction features. Various attachments are also described, as well as graphic illustrations of their application in handling a wide variety of products.

Clip and Mail Today!

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division

General Sales Offices:

WESTERN: SAN JOSE, CALIFORNIA • **EASTERN:** HOOPESTON, ILLINOIS

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division

P.O. Box 1120, San Jose 8, Calif.
or 103 E. Maple St., Hoopeston, Ill.

Please send me a copy of your Bulletin No. 501 E on "M & S Fillers by FMC."

512-1

Name _____ Title _____

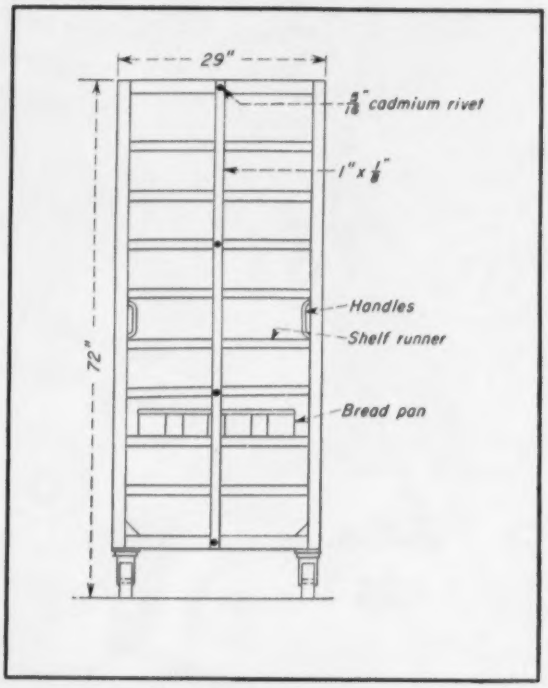
Company _____

Address _____

City _____ Zone _____ State _____

his supply. In this way there is a daily record of use and furthermore, dependence no longer rests on a single individual.

A modification is to have a member of the laboratory or office personnel actually hand the daily supply to the foreman.—*Dr. Karl R. Fellers, Head Dept. of Food Technology, U. of Mass., Amherst.*



Proof Rack Made Safe

Standard racks are used in most bakeries for racking bread and bread pans. Little difficulty is encountered in racking bread as there is no tendency for the loaf to slide on the rack. However, bread pans have a smooth metal bottom and have a tendency to slide when the rack is moved to the proof box. This is especially true where there may be a slight incline at the entrance to the proof box or enroute.

At Arnold Bakers, we had several foot injuries due to the bread pans sliding off the ends of the racks and falling on the operator's toes. Even safety shoes did not give adequate protection. The problem was solved in the following manner.

Retaining strips 1" wide by ¼" thick (see sketch) were fabricated with four punched holes to match the spacing of the shelf supports. These strips were mounted midway between the corner posts on the ends of the racks. This served as a retainer strip so the pans could not slide off the ends of the racks during transportation.

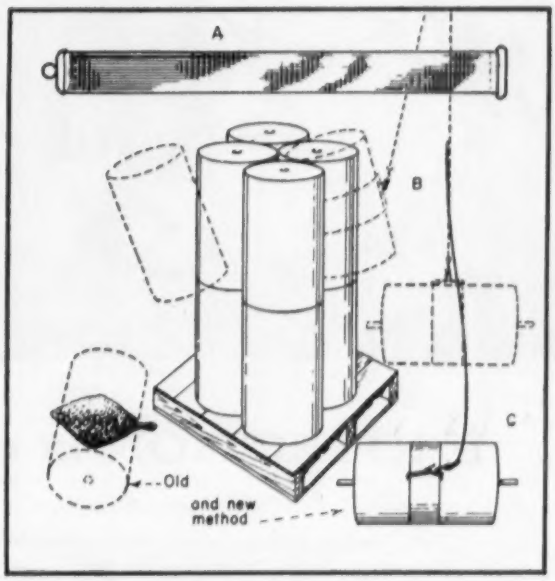
The racks were galvanized before fabrication, so it was considered impractical to field fabricate these strips from galvanized stock, due to the possibility of rust development when the strips were cut and drilled. Welding could not be considered, as this would burn off the galvanizing on the racks and create immediate corrosion at the weld points.

The problem was solved by having the rack manufacturer fabricate a vertical strip punched with four holes which matched with the top, bottom and two intermediate shelf runners. These strips were hot dipped galvanized after fabrication. The four shelf runners were field drilled with 21/64 in. holes to match the holes on the retainer strips.

Strips were riveted in place with ⅛ in. cadmium rivets supplied by the fabricator. The cadmium plating on the rivets is ductile enough so that it does not flake off when the rivet is peened over. Further, as the rivet is peened, it expands within the hole, which helps to prevent rust at the point where the shelf runner is field drilled.

It was found that the two vertical strips gave adequate protection and were very easily installed. Horizontal strips at each shelf were considered and rejected. This would have required 18 strips per rack and 36 field holes. Furthermore, the horizontal strips would be offset, presenting spacing problem to avoid existing rivets on the corner posts.

It should be noted that each rack is provided with handles for pushing and pulling the racks. For safety reasons, these handles should always be used when transporting the racks. Use of the corner posts will result in jammed fingers and pulling on the retainer strip will soon distort this strip, as it is not structurally designed for other than a pan retainer.—*Leonard F. Patridge, Consulting Engineer, Tuckahoe, N. Y.*



Rolls of Paper Easily Handled

Our former method for unloading 300-lb. waxed-paper rolls from skids was to tip them over by hand onto hemp bumper pads.

This operation often resulted in damaged rolls, and also was hazardous to workers.

Now, skids transporting eight rolls are positioned under an overhead chain hoist trolley, where a 12-in.-wide gripping, sling-type belt—(A) in sketch—is secured around a roll (B) at its middle. Then the hook on the end of the hoist chain is inserted in the loop in the end of the sling so that when hoist is operated roll is lifted off skid to assume a horizontal position without damage.

In this position, the roll shaft (C) is easily inserted, making it possible to position the roll in the machine while it still is safely cradled in the sling.

Thus, chances of injury to the rolls have been reduced, operator safety has been improved, and time required to set up rolls has been minimized.—*David W. Reese, Foreman, National Biscuit Co., Cambridge, Mass.*

PROTECTION is our business, too

Just as valiant firemen are on around-the-clock alert to protect your life and property—J&L Steel Containers protect your products by providing dependable packaging that assures safety in transportation and storage. Their precise fabrication assures accuracy in all fittings and closures.

J&L drums and pails are chemically cleaned and dried by the JaLizing process. This assures a clean and dry, rust-inhibiting surface and increases the adherence and durability of decoration and interior lining.

Special protective interior linings are available to provide the best possible packaging for your products.

Jal-Coat, J&L's lithographing process, applies your trademark and sales message to the finished container . . . *no side seam touch-up is ever required.*

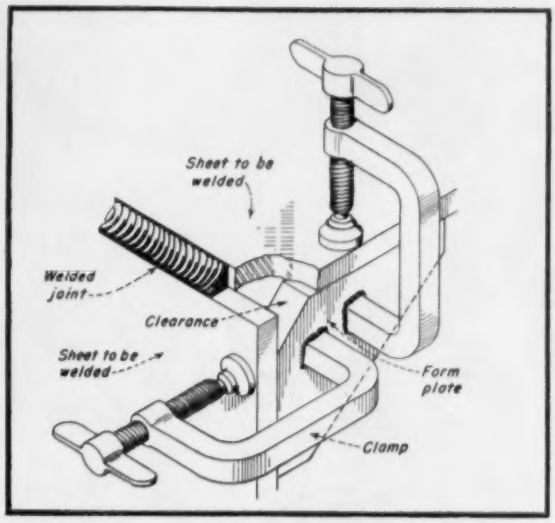
Plants located at Atlanta, Ga.; Bayonne, N. J.; Cleveland, Ohio; Kansas City, Kansas; Lancaster, Pa.; New Orleans, La.; Philadelphia, Pa.; Port Arthur, Texas; and Toledo, Ohio.

JaLiner, J&L's integral plastic contour liner, is designed to solve "hard-to-package" problems.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION-PITTSBURGH

CONTAINER DIVISION
405 LEXINGTON AVE., NEW YORK 17, N.Y.



Right-Angle Corner-Welding Clamps

Frequent in general welding work is the job of joining two flat plates at right angles to each other.

Without proper work-holding devices, it's difficult to position the plates. So a finished job of joining is usually out of square in several ways.

Here, a pair of right-angle corner clamp assembles (see sketch) are well worth the time required for their construction. The plates that are made into the form for the rightangle corner are of sheet steel. Two adjacent sides of these must be exactly at 90 deg. to one another, with the corner between them cut away for clearance.

The angular side of the form reduces the weight and also allows two plates to be flame-cut from a single square of material.

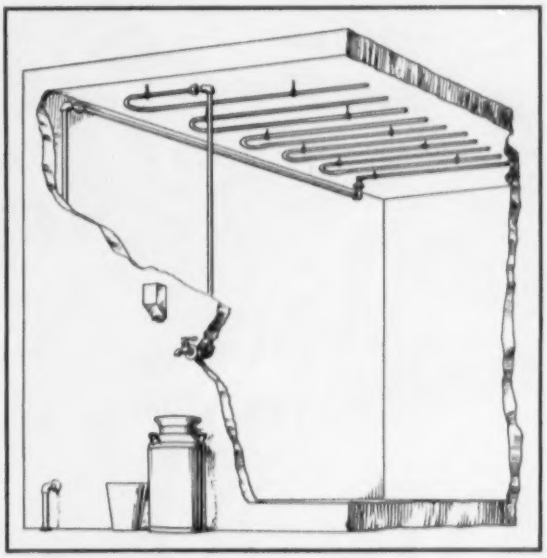
For holding the two pieces of work in correct relation to one another on the form-plate, two standard C-clamps are modified by cutting off their fixed anvils and welding the frames to the form-plate.

The frame of the clamp should be cut so that the center line of the C-clamp screw intersects the center of the formplate edge. Old clamps which have been damaged on the anvil end often can be employed for this purpose.

In use, a form and its clamps are attached to each end of the metal sheets that make the right-angle joint. It is obvious that the grip on the two plates to be joined will now be secured and that the final adjusting of them can be precise.

With the clamp in position, the outside of the joint can be reached easily, by welding electrodes or torch, throughout its full length, while the inside of the joint is also accessible for the greater part of its length. Then the short unwelded lengths at the end of the joint can be completely welded after the clamps have been removed.

Range of thickness accommodated by the clamps is limited only by the capacity of the clamp. Even very thin pieces, which are commonly quite awkward to hold at right angles for welding or brazing, can be held securely. —*C. T. Bower, Tool Engineer, London, England.*



Water Cooled Easily At Low Cost

Water from the tap gets pretty warm here in the summer, and employees around the plant complained. Then, we installed a coil of pipe, just under the roof of the cooler, sufficiently long to hold approximately 10 gallons.

Water line was connected to this coil. Outlet line, was piped down, then through cooler wall, and a faucet was added, thus insuring an ample supply of cool drinking water.—*Raymond Coffeet, Dept. Foreman, Sunflower Coop Creamery, Everest, Kan.*

Way to Protect Written Formulas

Occasionally, it's necessary to make minor adjustments in our master mix formulas. We used to write the new formula on a slip of paper and attach it to the scale support, where the operator could see it. However, the paper sometimes became soiled, torn, or lost.

Now, we have remedied this situation by printing the various formulas on ¼-in.-thick cardboard stock, 2½ in. by 6 in.., and either wrapping these cards completely in cellophane or coating them with clear lacquer.

We also made a Lucite box to hold formula cards. When

CAN YOU USE $50?

Then here's an opportunity to get it.

Send one of your ideas to FOOD ENGINEERING.

Each month $50 is presented to someone like you for the best item in this department. And the chance that it will be you is now running about one in twelve.

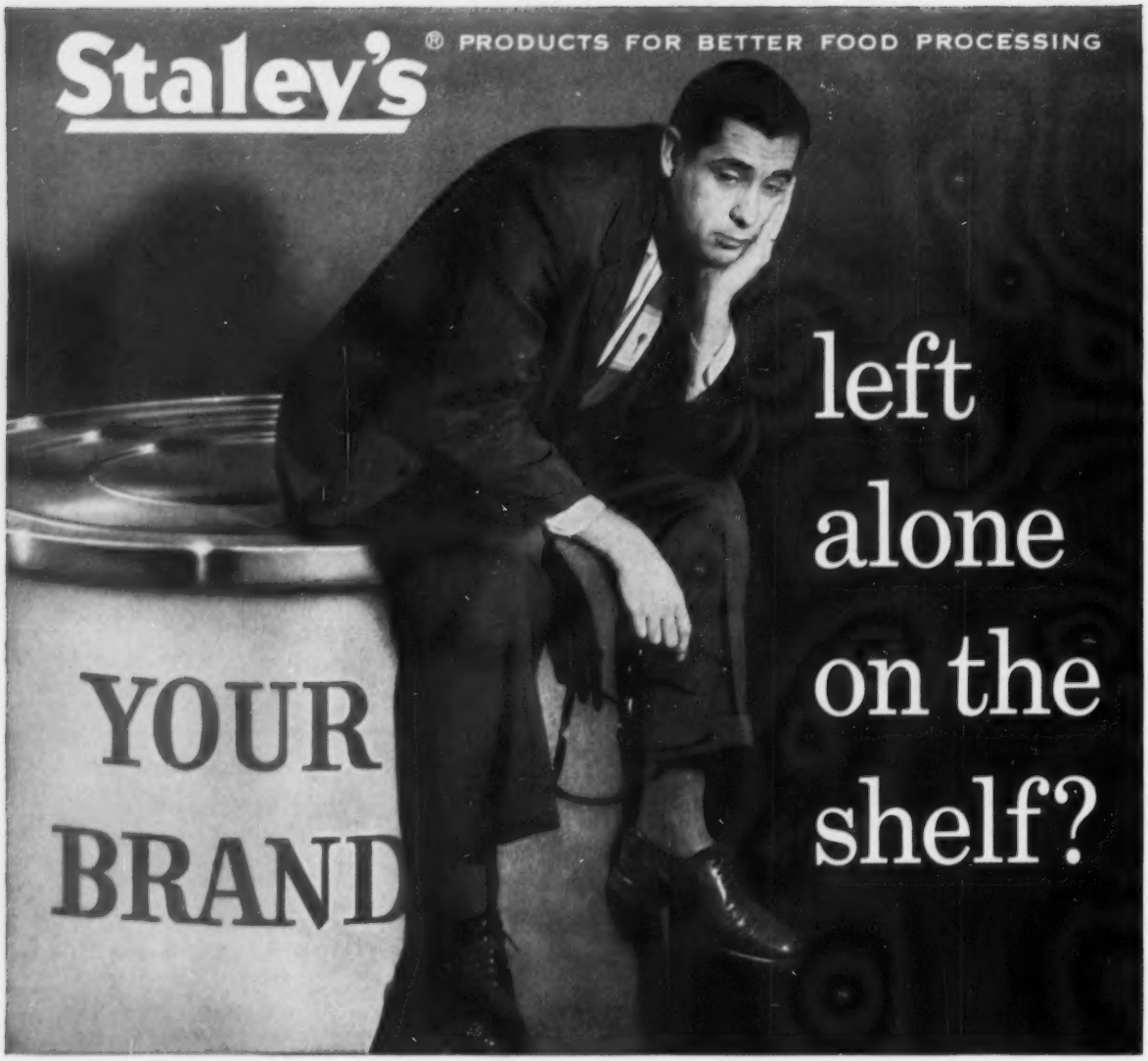
Also $5 to $15 is paid for each contributed item used. So a few minutes time may net you as high as $65.

Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

We'll do the finished writing and drawing for you.

Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

MARCH PRACTICAL IDEA WINNER was "Live-Conveyor Tightener," send in by Thomas L. Parks, Assistant Superintendent, Coca-Cola Bottling Co., Greenville, S. C.



Sweetose perks up canned food flavor!

Nothing sells like flavor! And unless your brand has it, *you* could be left alone on the shelf. To guarantee highest quality, canners from all over the nation choose Staley's Sweetose Syrup . . . a special enzyme-converted corn syrup that brings out taste appeal at its best! Sweetose gives you *accurate sweetness control* for perfectly balanced, unmasked flavor . . . helps hold fresh, natural color and texture, too. And easy-to-handle Sweetose is economical to use! Try it soon yourself . . . and taste real flavor goodness that *keeps* your brand moving off grocers' shelves at a money-making pace. See your Staley representative now or write for more information.

Sweetose®
SYRUP

A. E. Staley Manufacturing Company, Decatur, Illinois

50th ANNIVERSARY YEAR

PRODUCTS FROM CORN
Staley's
AND SOYBEANS

OTHER QUALITY PRODUCTS
Regular & Intermediate Corn Syrups
Canners Starches
Refined Corn Oil
Zest®, Monosodium Glutamate
Sta-Sol® Lecithin

screwed to the frame of the scale, this box allows placement of the card with the correct formula at the front, where it can easily be seen through the Lucite. And so the formula is protected at all times, along with the other cards not currently in use.—*Ernest R. Ables, Chief Chemist, Sweets Co. of America, Inc., Hoboken, N. J.*

Placards Help Reduce Waste

Signs posted about our plant have proved helpful in reducing waste losses by calling every employee's attention to the expense involved.

Pointed out on these poster-reminders is the cost of empty glass containers (from 5 to 10¢ each) and of filled containers (25 to 65¢ each). Raw-product cost is also detailed (ranging from 15 to 26¢ a pound) and likewise ingredient cost (up to 30¢ per pound).

Cost of supplies that must be discarded due to carelessness is further stated (as 25¢ per hundred for labels, and 9 to 12¢ apiece for boxes).

Since employees at our plant participate in a bonus, they share in the cost of waste—as graphically and forcefully pointed out by our posters.—*C. F. Fulton, Plant Engineer, Old Dutch Foods, Inc., Blasdell, N. Y.*

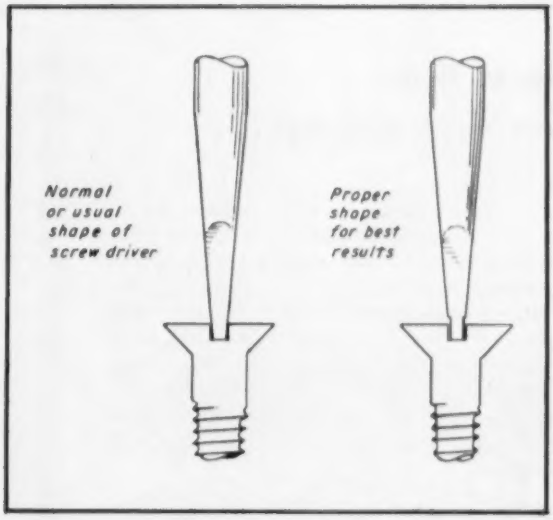
Tray for Can Stacking

A cleaner, more efficient canning operation has been achieved by the Walla Walla (Wash.) Canning Co. through use of special trays. These are for stacking open or unsealed cans of fruits and vegetables while they await passage through the lid-fastening machine.

Each tray, measuring 14x21 in., has a 1x1⅜ in. wood rail on three sides, to which is attached a ¼-in. bottom of Masonite Tempered Presdwood, with the screen side exposed and the smooth side down.

Advantages are that the tray bottom does not splinter due to the sharp edges of the cans, and it lasts longer than plywood.

When loaded and stacked, the sharp edges of the open cans rest against the smooth, splinter-free panel of the tray above.



Correct Shape for Screwdriver Tips

Although the screwdriver is a much used tool, few manufacturers, and very few users, ever shape the working-end for its most efficient use.

When properly ended with a shoulder (see sketch), the screwdriver stays in the screw slot with very little thrust pressure. The result is a job more easily accomplished without the danger of shearing or marring the screw slot.

It is easy to work the screwdriver tip into the correct shape, using only a file.—*Earl F. Burk, Officer in Charge, Processed Products Inspection Service, USDA, Hammond, La.*

For Surer Checks on Ladders

Your ladders can be more readily inspected for safe condition if left without a finish coating, or if given a transparent finish, such as varinsh, shellac, or other clear preservative. So reports the American Standards Assn.—*Technical Bulletin, General Foods Corp.*

Versatile Reversible Conveyor

To facilitate movement of either bottled or canned beer from the pasteurizer at Falstaff Brewing Co., San Jose, Calif., the conveyors (see arrow) handling flow from this unit are reversible.

Thus, they can feed to the bottle-casing line, located on one side of the pasteurizer or, by reversing the movement of the conveyor, to the can-casing line.—*FE Staff.*

More than just instruments...

Honeywell service begins when you first decide you need instruments, and continues long after your instruments are paid for. First, the Honeywell field engineer goes into a huddle with your own engineers and production men, and makes a complete rundown on what is to be measured or controlled, to what accuracy, under what conditions. Then he goes to work with Honeywell application engineers who have first-hand experience in your industry and processes.

The *complete* system is designed, including valves, interlocks, safety devices, with instrument recommendations drawn from the big Honeywell line. Honeywell makes all types of instruments . . . electronic, electrical, pneumatic and mechanical. And because the line is so complete, instrumentation recommended for your application is selected without bias. Instrumentation by Honeywell means the economy of "one-stop shopping" and a single responsibility for your complete control equipment. After your system is designed, produced and delivered, Honeywell engineers are available to supervise installation and start-up.

Expendable supplies for all your instruments . . . thermocouples, wires, wells, recorder charts, ink . . . can be purchased at maximum convenience and economy through the HSM (Honeywell Supplies Man) Plan.

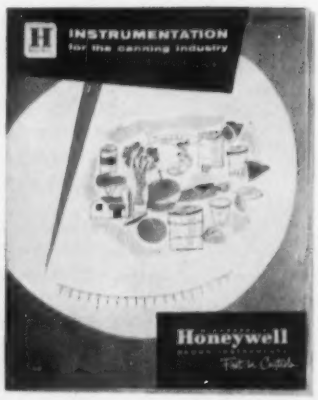
Suppose you need spare parts in a hurry. Your nearest Honeywell branch office is your storeroom for standard items, and the Parts Depot in Philadelphia carries a complete spare parts inventory. Most deliveries are made within 24 hours. There are more than 110 Honeywell service centers spotted strategically throughout the U.S. and Canada. You'll find it's a mighty comforting feeling to have such service so close, whenever or wherever you need it.

Honeywell help in emergencies is swift. But many emergencies can be prevented with periodic service. Under a simple agreement, a Honeywell service man will visit your plant at regular intervals to inspect, clean, and adjust your instruments and controls.

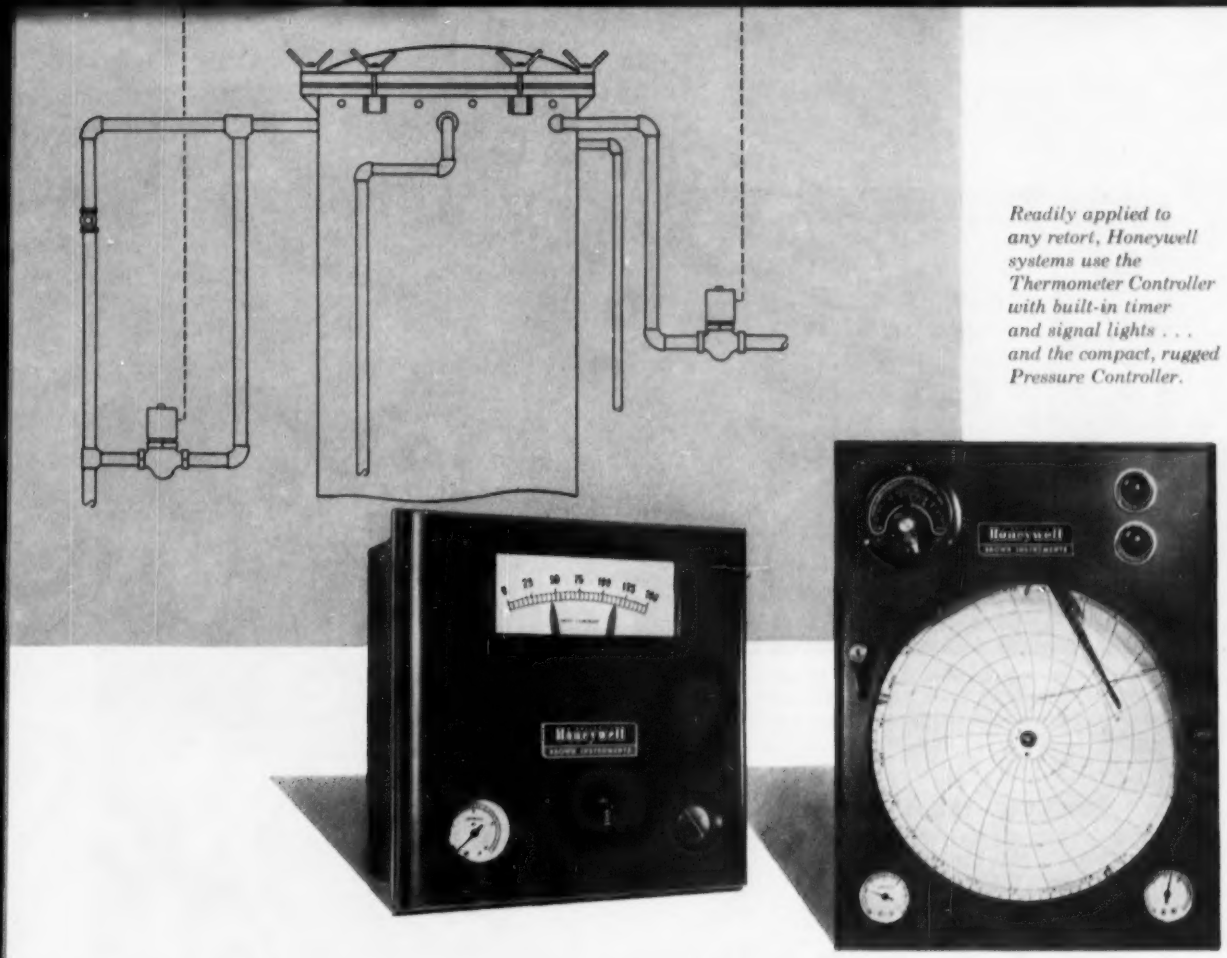
Want to maintain your own instruments? Honeywell's tuition-free training school teaches your instrument technicians how. Intensive courses range from two to fourteen weeks, and are repeated several times a year.

Honeywell offers far more than instruments. It offers unparalleled service that begins when you call a Honeywell sales engineer. He's as near as your phone.

Your retorts can "go automatic" .....with



● **REFERENCE DATA:** Write for Bulletin B-32, "Instrumentation for the Canning Industry."



Readily applied to any retort, Honeywell systems use the Thermometer Controller with built-in timer and signal lights . . . and the compact, rugged Pressure Controller.

Honeywell control systems

IT'S EASY to put a big dent in production costs, when you add Honeywell control systems to your vertical retorts.

These packaged control systems allow you to use your retorts and manpower to the best advantage. Once you have set the cooking cycle you want, the instruments take over. They bring your retorts up to process temperature quickly, hold them there accurately for the specified time, then immediately start the cooling action. No more wasted time and motion . . . no more costly over-processing . . . no more guesswork in your retorting operation.

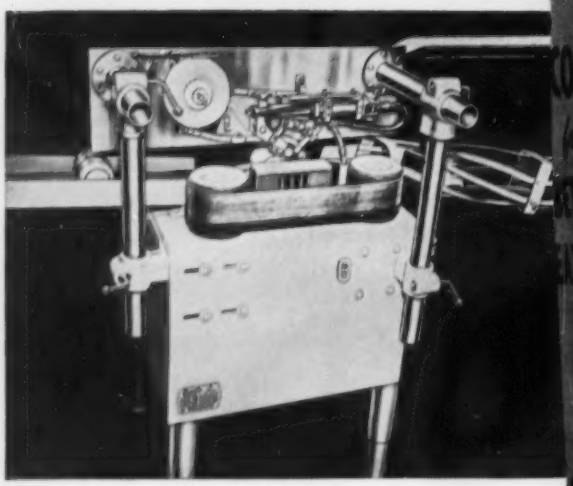
Yet, the first cost is low, and can be quickly repaid by the savings the systems make possible. The systems can be installed by your plant electrician. Or, even easier, you can order Honeywell-engineered panelboards, wired and piped at the factory, or unmounted . . . at your option. And you can change your control system by merely adding minor accessories, because these systems are built around the same basic instrument and use standard components.

There are systems to fit any retort and every process: —systems which automatically control steam or water cooking—systems with automatic venting . . . automatic blowdown . . . pressure cooling . . . or combinations of these. Cycles can be set for any cooking time from a few minutes to three hours. The automatic venting system, based on minimum time and temperature, conforms to the recommendations of the Research Laboratory of the National Canners' Association.

Find out how Honeywell controls can go to work on your canning problems. Just call your local Honeywell sales engineer . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa. — in Canada, Toronto 17, Ontario.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls



Pfaudler Outsert Applicator attaches message to your package, automatically. Eliminates costly hand labor. Places outfold accurately. Becomes part of production line, between labeler and casing machine.

Now you can

Outsert Leaflets

on packages like this without hand labor!

Revolutionary new machine attaches recipes, contest rules, coupons, etc., *automatically*—up to 220 per minute!

To bring you the sales advantages of *outside message attachment*, without slowing down your production line or using costly hand labor, Pfaudler has perfected the fast-action Outsert Applicator, Model OA-3MC.

This efficient machine puts your message precisely where it belongs on your package. There's no chance of sloppy hit-or-miss location of the outfold covering your brand name or trademark, as often happens with hand labor.

Up to 220 containers per minute

The Pfaudler Outsert Applicator attaches your consumer messages to all cylindrical containers of plastic, glass, paper or metal—2⅝" to 7¼" in length, 1¼" to 6½" outside diameter. (Special designs are possible for containers outside these limits.) Speed varies slightly with container size.

Fits right into production line

The unit fits readily into most production line setups, requires only four square feet of floor space. There, it works in continuous operation, gripping free rolling containers from your labeling machine and forwarding them, with leaflet accurately attached, to the casing machine, ready to pack and ship.

Low maintenance

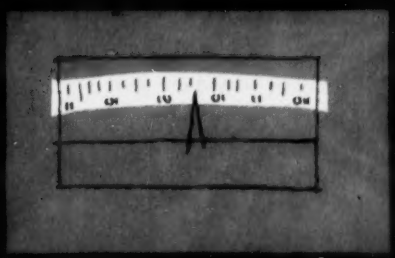
Advanced design and careful selection of materials give you a durable machine, capable of long continuous runs. And there are no delicate mechanisms to fail.

If you're interested in the sales advantages of outserts for your product, simply forward a sample labeled container with outsert affixed correctly. Pfaudler engineers will analyze your requirements and send you full information. Or, if you prefer, write for Bulletin 933. There's no obligation, and you're the one to benefit.

THE PFAUDLER CO. **ROCHESTER 3, N.Y.**

Electrically exact quality control governs the uniformity of Norda Nodes, in the nationally notable new Norda spray-drying plant.

Nothing's known like Norda Nodes ...Spray-dried for you by Norda



The name for fine spray-dried flavors now seems to be Norda Nodes.

By superior methods, with today's most efficient machines, Norda locks true-fruit flavors into almost invisibly tiny, colloid-coated particles. Their *in-blown, in-grown* richness is released only when liquids meet the dry mixes they flavor.

You consequently get complete flavor uniformity. Your flavored products have longer shelf and storage life. The *real* flavors you put in your products reach your products' satisfied users unchanged.

Find out about the excellence and economy of Norda Nodes. Your business letterhead brings *free samples.*

"Flavor it with a Favorite"— Norda Nodes

Norda®

Norda, Inc.
601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • SAN FRANCISCO • TORONTO • MONTREAL • HAVANA • LONDON • PARIS • GRASSE • MEXICO CITY

PROVED BY PERFORMANCE OF *OVER A MILLION* TRAPS!

YARWAY IMPULSE STEAM TRAP

the only moving part

...a small stainless steel valve that literally floats on the condensate load. Gets equipment *hot in a hurry—and keeps it hot!*

Using a theory of thermodynamics never before applied to steam traps, the YARWAY Impulse Trap revolutionized the industry *20 years ago.* Today over a million YARWAY traps have successfully proved the Impulse principle.

Advantages like the following continue to win new users, convince old users to standardize:

- **QUICK HEAT-UP AND EVEN TEMPERATURES OF EQUIPMENT**
- **GOOD FOR ALL PRESSURES WITHOUT CHANGE OF VALVE OR SEAT**
- **SMALL SIZE—LIGHT WEIGHT**
- **ONLY ONE MOVING PART**
- **STAINLESS STEEL—minimum maintenance**
- **WON'T FREEZE UP**
- **A COMPLETE LINE of sizes and types for every requirement**
- **IMMEDIATELY AVAILABLE from 270 local Industrial Distributors**

For free Trap Selector, or 24 page bulletin, write
YARNALL-WARING COMPANY 127 Mermaid Avenue, Philadelphia 18, Pa.

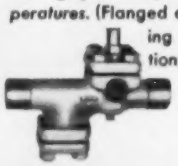
THERE'S A YARWAY IMPULSE STEAM TRAP FOR EVERY NEED

SERIES 60 and 120
For all *normal* trap requirements, pressures to 400 and 600 psi.

½" No. 20-A
For *light loads* on tracer lines, steam mains, small presses, etc.

SERIES 40
For *heavy loads* requiring extra high capacity steam traps

INTEGRAL-STRAINER HIGH PRESSURE TRAP
For *high pressures, high temperatures.* (Flanged or welding connections.)



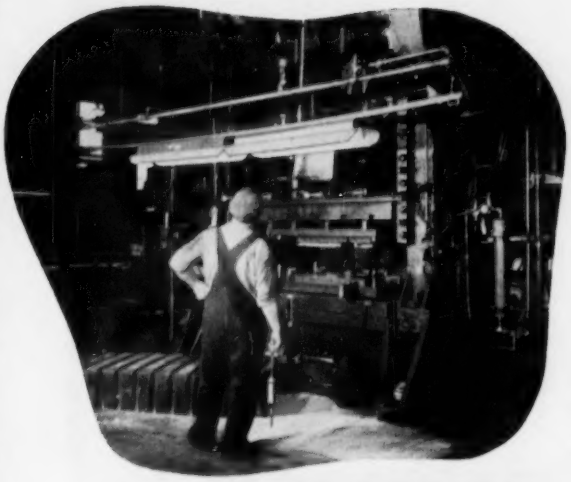
YARWAY

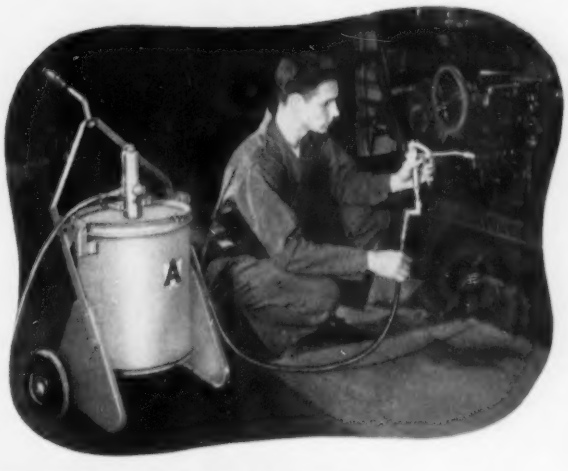
IMPULSE® STEAM TRAP
OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

SAVINGS START

when you stop "hand feeding" hungry bearings... and change lubrication methods from

Backward to Forward!

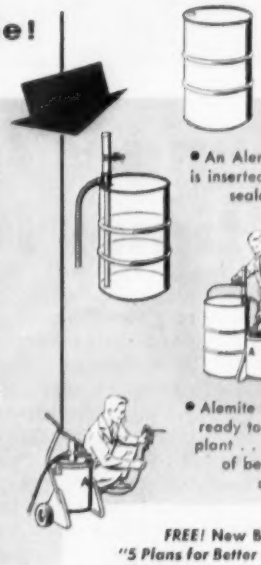




ALEMITE PORTABLE POWER GUN

saves 23.9 man-hours for every 100 pounds of lubricant

...saves right down the line!



- A 400-pound barrel of lubricant—any type—arrives at plant oil room. It's sealed, fresh, "refinery-clean."
- An Alemite Power Transfer Pump is inserted in drum. Lubricant stays sealed against dirt, grit, contamination.
- In just 60 seconds a portable power gun is filled with lubricant that is still as fresh as when it left the refinery. No mess—no waste!
- Alemite Portable Power Gun is ready to roll anywhere in the plant . . . to service hundreds of bearings with clean, safe lubricant!

Are you lubricating hundreds of bearings with ordinary hand gun equipment that's best suited to service only a *couple of dozen bearings?*

An ordinary hand gun can be emptied in a few minutes. But an Alemite Power Gun gives positive, fast, safe lubrication to hundreds of bearings *without a single re-fill!* This difference means a saving of 23.9 *man-hours* on every 100 pounds of lubricant used. Because lubricants are always kept "refinery-fresh," machines get better protection, have less breakdowns. You make important *savings in machine-hours* . . . increase production, cut maintenance costs!

An Alemite Portable Power Gun eliminates wasteful spillage . . . makes housekeeping easier, less expensive . . . reduces product spoilage. Air or electrically operated models for all types of lubricants. There's a type and size pump for *your* plant. Mail coupon at right for the full story about Alemite savings!

***FREE!* New Booklet:**
"5 Plans for Better Lubrication"
Alemite, Dept. FF-56, 1850 Diversey Parkway
Chicago 14, Illinois

Please send me my FREE copy of "5 Plans for Better Lubrication."

Name .....

Company .....

Address .....

City ..... State .....

ALEMITE

REG. U. S. PAT. OFF.

A PRODUCT OF SW STEWART WARNER

Ask anyone in industry

A Product of STEWART-WARNER CORPORATION

B.F.Goodrich

Photo courtesy Alfred Nickles Bakery, Inc., Navarre, Ohio.

Bakery changes to Koroseal belts, gets 11 times longer service

In this bakery, bread used to ride canvas belts from ovens through cooling tunnels to wrapping tables. But oily film clinging to the warm loaves stained the canvas, made it impossible to keep clean, soon ruined it.

When a B. F. Goodrich distributor heard belts were lasting only a month, he suggested they change over to Koroseal conveyor belts. They've lasted a year—11 times longer—and are still going strong. No maintenance, no sign of wear.

Because it's made of Koroseal flexible material, this improved food-handling belt stands cooking oils, animal fats, most acids—and it stands hard use, rough handling, and just about everything else that ruins most material. And Koroseal belts have no odor, no taste, never get rancid.

Unlike belts that are just coated with plastic, Koroseal is used throughout the B. F. Goodrich belt, and so resists cracking and peeling, never gets soft or sticky. Its smooth, polished surface makes it a cinch to clean, too. You don't have to scour it. Just a wipe with a damp cloth and detergent, and the Koroseal belt is as clean and new looking as ever.

Another belt, developed by B. F. Goodrich for the food industry, is a green belt that's ideal for inspection lines and on processing operations where grease and heat or cold are a problem. The B. F. Goodrich distributor near you will be glad to tell you more about these belts. Give him a call, or write *The B. F. Goodrich Co., Dept. M-633, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich

INDUSTRIAL PRODUCTS DIVISION

SeaKem EXTRACTS

An ADVERTISEMENT by and about SEAPLANT CHEMICAL CORPORATION of New Bedford, Mass.

FAT MARKET

Interested in low-calorie foods? From all reports, a great many other people are too—including the sugar and candy producers who are beginning to see their market shrink.

Well, we don't want to take sides in this controversy. We have too many good friends on both. And, we can see good arguments on either side of the fence, too. Your doctor and your common sense will tell you that if you're overweight, low-calorie foods make good sense. On the other hand, if your energy requirements are high, you need a high calorie intake.

On the low-calorie side, *Printers' Ink* pointed out some interesting figures a short time back. This well-known marketing publication reported that we have some 35 million overweights in the prime of life in the U. S. today, and that, because of this fact, there is a trend toward lower-calorie diets with dietetic food sales booming.

The significant reasons behind this trend, the magazine claims, are the medical and insurance emphases on normal weight for good health together with the desire of people to look their best.

The effect is that the largest of the regular food producers are now competing with the pioneering specialists to increase the output of low-calorie products in such categories as baked goods, beverages, candies, jams and jellies, salad dressings, milk puddings, toppings, cereals and dairy products.

To all of this good reporting we would only add a crass commercial note. All we say is that SeaKem Stabilizers have done a good job of stabilizing, bodying, thickening and gelling a great variety of food products. Also of significance, we believe, is the fact that our Stabilizers add little or no caloric value to the finished products.

On the other hand, if you're interested in preparing, say, a liquid product loaded with energy-giving sugar for the teen-age market, SeaKem Stabilizers have done, and will continue to do, a good job in this area, too.

So, if processing is your problem, SeaKem Stabilizers may be your answer, whether the companion ingredient is sugar, sodium sucaryl or saccharin. Any applications we can help on?

"Quick-Set" Puddings

We've been generating some enthusiasm in New Bedford lately over our new "Quick-Set" puddings. As most people know, in puddings, the pendulum has swung from cooked puddings, where you added powder to milk and then boiled the mixture, to the "instants" where you merely add the powder to the milk and beat.

There are disadvantages to both cooked and instant puddings. In the case of cooked puddings the disadvantage is the difficulty of preparation since constant stirring is necessary while the mix is being heated. The instants have licked the preparation problem, but the quality of the finished products sometimes leaves something to be desired.

We've tried to solve the problem with a compromise. With our "Quick-Set" puddings, you heat only the milk to a boil. At that point, you remove the milk from the heat, add to the powder, stir, and you're through. The product has most of the advantages of cooked puddings while being easier to

(*Please turn the page*)

Quickies

- The items on these pages are from recent issues of our house organ, published under this same SeaKem EXTRACTS masthead . . . regular issues also include technical discussions pertinent to colloidal problems . . . To be put on mailing list, just check the coupon on page 3.
- Known more familiarly as Irish Moss extractives, nature has provided an abundance of the source material from which SeaKem "Colloids Out of the Sea" are derived—and years of experience have proved the usefulness of these red sea plants in gelling, thickening, emollient and demulcent applications . . . However, real growth had to wait until modern technology could unscramble the intricacies of producing—on a tonnage basis—uniform, tailor-made extractives derived from an incredibly complex source material . . . Today, SeaKem Stabilizers are contributing important advantages to more than a hundred different food products ranging from chocolate milk and ice cream to salad dressings and frosting mixes.
- A more complete presentation of Our Story is available in an 8-page brochure entitled "Colloids Out of the Sea" . . . yours for the asking by checking the coupon on page 3.

Use convenient coupon on page 3 to check items on which you want more information.

prepare. The result is made possible by a combination of pregelatinized starches and a SeaKem Stabilizer. The reaction mechanism makes use of the milk gelling characteristics of the SeaKem Stabilizer. For more information, including starting formula, just jot down "Milk Puddings" on the coupon.

Special Chef's Special

Our Mid-West technical representative has sent us an interesting report about one of the country's leading chefs. This particular chef practices his art in a well-known Chicago hotel where he delights the guests with the quality of his sauces, gravies, aspics, frostings and other specialties.

You guessed it—he accomplishes many of his results with SeaKem Stabilizers.

It seems that he was brought up on the use of Irish Moss in France (where, incidentally, they call it French Moss and resent the "Irish"). Naturally, his father's father taught him to cook with *ze moss* and it was *trés tragique* when he first came to the U.S. and found none readily available.

Seaplant Chemical came to his rescue, of course, and as he has discovered SeaKem Stabilizers' high degree of uniformity, predictability, etc. (particularly in comparison with the unrefined products he knew in his homeland), he has become properly enthusiastic.

Now if we can only get him to tell us some of those recipes . . .

Apple Pie

"No pH problems, no problems at all—it really makes a beautiful pie." That's the way one user described our formulation for Apple Pie Filling using SeaKem Stabilizer Type 202.

Absent-minded SeaKemist orders apple pie.

So if you'd like a better apple pie, let us know. We'll be happy to send you the simple formulation.

A "Pop" Makes A Point

As most chemists and technologists know only too well, in many stabilizing problems more than one reaction can come into play. This frequently makes it difficult to pin down exactly what to predict and is why so much of our sales correspondence has to contain such sentences as, "There is no substitute for an open mind and willingness to try a few ideas and carefully observe the results. We'll gladly send you some samples along with suggested testing procedures . . ."

One of the best examples of what we're referring to is the use of Type No. 15 SeaKem Stabilizer in "frozen pops." This application was discovered in our laboratory and passed on to some customers. It has resulted in a wonderful volume of business for them as well as us. But neither we nor our customers, despite the expenditure of a good deal of investigative effort, can yet explain the complete "why" of the superb results being achieved.

The point we are trying to make is not that we don't know a lot about what goes on with SeaKem Stabilizers but rather that countless new discoveries of useful applications for "Colloids Out of the Sea" are waiting to be made. We at Seaplant Chemical have many but by no means all of the answers. We repeat, "There is no substitute for an open mind and willingness to try a few ideas and carefully observe results." Tell us your problem and we'll gladly send you some samples along with our suggestions.

Speedy Chiffon

It used to be that it took 20 minutes to whip up a good chiffon filling. Now Our Favorite Company has come up with an instant chiffon. "Well," as our Saturday-night TV comedian says, "not really instant. It really takes three whole minutes or so." We've got an institutional formula for Butterscotch, Vanilla and Lemon that's pretty terrific. Won't work for chocolate, though. The cocoa butter melts and destroys the whip.

If you'd like the formula, we'd like to send it to you. We'll be glad to reserve a couple of drums of SeaKem Type 102, an essential part of the formulation, at the same time. Just request "Starting formula for Chiffon."

Can This Work With Relish Get You Out of A Pickle?

A while back *Food Engineering* ran an interesting article, under the title "Quell Separation in Pickle Relishes," covering an experimental program designed to improve the appearance, uniformity and quality of pickle relish.

The work reported upon—which might have been better entitled "Drained Weight of Pickle Relishes Increased"—was conducted by E. E. Anderson, A. P. Plank and W. B. Esselen of the Department of Food Technology, University of Massachusetts.

A SeaKem Stabilizer, among other materials, was tested in relish packs at different levels. Some very definite advantages resulted: drained weights were increased; flavor was improved; body and "mouth feel" were improved; appearance and shelf value also were improved.

We have in this connection a special bulletin on the subject "How to Stabilize Relishes" which we'll gladly send you. Just ask for SeaKem Technical Bulletin No. 142.

Harvard Beet Sauce

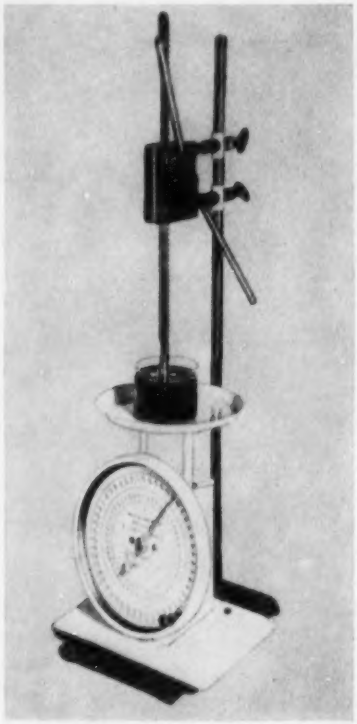
Harvard Beet Sauce is one of the latest of a long line of sauces that have fallen under the enticing spell of Irish Moss. If you'd like a copy of a suggested formula for one of the best HB Sauces ever to come out of Cambridge, be sure to let us know.

See You In June?

We'll welcome a visit from you at the convention of the Institute of Food Technologists to be held at the Jefferson Hotel in St. Louis, June 10-13. Our hats will be hanging at Booth No. 19.

And while on the subject of "welcome mats," if your vacation this summer takes you anywhere in the vicinity of New Bedford, we'll also welcome a visit from you at the plant—and the opportunity to show you at first hand the modern chemical processes and control procedures used to make SeaKem Stabilizers.

Use convenient coupon on page 3 to check items on which you want more information.



Simple Apparatus Measures Gel Strength

Designed by our Research Department, the simple apparatus above is easy to reproduce in any laboratory setup and has been found satisfactory in practice.

It consists essentially of a 500 gram dietary balance and a plunger approximately 1.1 cm. in diameter. The plunger may be activated by hand or through the medium of any mechanical device.

The technique is to gradually force the plunger against the surface of a gel while keeping an eye on the balance pointer. When sufficient force is applied to rupture the gel, the balance pointer snaps back. The point of maximum deflection is noted as the breaking force. The average of three breaking forces is recorded.

More detailed information on both setting up the apparatus and techniques to follow in making determinations will be gladly supplied. Ask for "Gel Strength Measurements."

Working Under Pressure

We want to go on record in favor of the pressure packed cans that deliver whipped cream and a fast increasing number of additional items at the touch of a button. We like the convenience and we like knowing that SeaKem colloids sometimes help make this kind of modern sorcery possible.

But even more interesting to us is the role of SeaKem brand colloid agents as a "tool" ingredient in such formulations. Oddly enough, in many instances (and we wouldn't admit this to anybody but the public), no SeaKem colloid alone works as well in some of these applications as does a combination of a SeaKem colloid and other ingredients such as emulsifiers and other gums. Conversely, in many cases no combination of stabilizing ingredients without a SeaKem stabilizer works as well as the combination which includes Our Product.

We don't know the exact mechanisms of some of these synergistic effects but like electricity and the tides, we sometimes know how to control and use them to advantage.

So, if you've got a complex stabilizing problem, why not consult with us? It may be that we've learned something over the years that could save you time and money in preliminary laboratory work.

did you know?

. . . that SeaKem "Colloids Out of the Sea" are uniquely different both in their reactivity with proteins and their ability to work well "in combination" with other colloidal materials.

. . . that because of their reactivity with milk in any form, soya and egg proteins, very small amounts of a SeaKem Stabilizer often will react with, and thus bring into more effective play, naturally-present ingredients, making possible formulation accomplishments and production economies users call "incredible".

. . . that SeaKem Stabilizers can be used as "tool" ingredients "in combination" with other colloidal materials (starches, locust bean gum, carboxymethylcellulose, etc.) to build behavior and advantages which cannot be obtained from any one of these ingredients alone.

SEAPLANT CHEMICAL CORPORATION
63 David St., New Bedford, Mass.

Gentlemen:

Please send me more information on the following items: _____

_____

Please send me your "Colloids Out of the Sea" brochure ☐

Please put me on your SeaKem EXTRACTS mailing lists ☐

Please send me information on the following special application: _____

_____

Your Name: _____ Title: _____
(Please Print)

Firm Name: _____

Address: _____

City and State: _____

Use convenient coupon above to check items on which you want more information.

Model "L" (350 lb.) provides complete truck cooling for over-the-road operation.

cargoes stay cool automatically ...with COLDMOBILE

Model "LE" (550 lb.) adds a convenient plug-in for electric stand-by operation. A split "LE" (600 lb.) is available for trucks of low body height.

This driver can forget about his cargo—for this Coldmobile truck-cooling system takes care of itself... maintains ideal truck temperatures even after many door openings. Now meats, poultry, dairy products—in fact, any perishables—*stay* fresh, completely protected at the proper temperature, all the time.

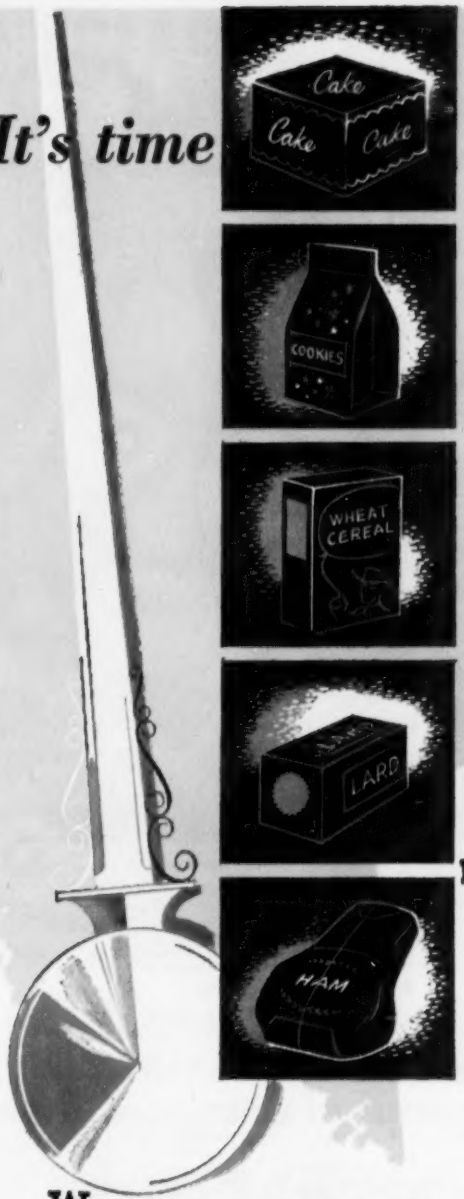
Coldmobile cuts costs! First cost is low...operating cost is low. Powered by the truck engine, Coldmobile eliminates the need for special batteries or an auxiliary motor. Yet there is no noticeable drag in truck performance or change in fuel consumption.

Defrosting is automatic! There are no special controls for the driver to constantly watch and adjust. Even oiling and greasing are unnecessary since all units are factory sealed, and all moving parts have their own sealed-in lubrication.

For complete information, write:

UNARCO

COLDMOBILE DIVISION
UNION ASBESTOS & RUBBER COMPANY
2900 West Vermont Street, Blue Island, Illinois



It's time ...to ask your suppliers for IONOL®, C.P. *impregnated packaging...*

newest, low-cost way to protect foods against oxidative spoilage

When fats and oils migrate from food product to box or wrapper, they rancidify quickly, causing deterioration of flavor and aroma.

The effective way to combat this serious threat to product shelf life is to incorporate Ionol, C.P.—a most efficient antioxidant—into the boxboard or wrapping material. Rancidity is then stopped right where it begins, at the *surface*.

In actual tests, baked goods stored at 85°F in Ionol, C.P. impregnated boxboard cartons, were free of rancidity at the end of ninety days. Without Ionol, C.P. protection, baked goods stored under similar conditions, often develop rancidity within a week.

When your food products contain fats or oils, Ionol, C.P. impregnated boxes or wrappers will greatly prolong shelf life. Additional protection can be assured by using Ionol, C.P. as a direct ingredient in your food products.

Ask your packaging materials supplier for this modern way to protect the good name of your brand label. Write to Shell Chemical for names of suppliers of Ionol, C.P. impregnated packaging.

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION, 380 Madison Avenue, New York 17, New York

Atlanta · Boston · Chicago · Cleveland · Detroit · Houston · Los Angeles · Newark · New York · San Francisco · St. Louis

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited · Montreal · Toronto · Vancouver

For more data, circle this page number on card at back →

where it touches food

USE STAINLESS

...for cleaner, more economical processing

Check through this list of advantages and you'll see why Crucible Rezistal® Stainless Steels have gained such wide acceptance in the meat and food processing industries —

- **Do not change the flavor or appearance of food in any way.**
- **Resist the corrosive attack of food acids and other elements.**
- **Withstand harsh cleaning chemicals that might affect other metals.**
- **Clean easily without developing the rough spots that harbor bacteria.**
- **Can't chip . . . they're solid stainless all the way through.**

Crucible Stainless Steels offer another practical advantage — *ease of fabrication.* You can bend them, shape them, weld them, machine them — make any equipment, no matter how complex, out of Crucible stainless. But let us help you decide how to put stainless steel to work for you. For fast action — call Crucible. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

Crucible Stainless Types for Food Processing

STAINLESS REZISTAL TYPE	NOMINAL %* Cr	Ni	Other	USED FOR
302	18	8		General Purpose
303	18	8	S or Se	Free-machining
304	19	9	.08% Max. C	Welding
316	18	12	Mo	High Corrosion-Resistance
304 LC	19	9	.03% Max. C	Used where intricate welding is required
316 LC	18	12	Mo Low C	Used where intricate welding is required
347	18	8	Cb	Welding (stabilized)

*Subject to U. S. Government restrictions.

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

FOAMGLAS®

the cellular, stay-dry insulation

In new —20°F. hardening room . . .

Carnation cuts construction costs with free-standing insulating wall of FOAMGLAS

The Carnation Company, Oakland, California, built this free-standing insulating wall entirely of FOAMGLAS. The free-standing wall enabled them to cut construction costs for their new —20° F. ice cream hardening room. FOAMGLAS made this possible because its rigidity and unusual strength enabled it to function as *both* insulation and structural wall. Not even temporary supports were needed.

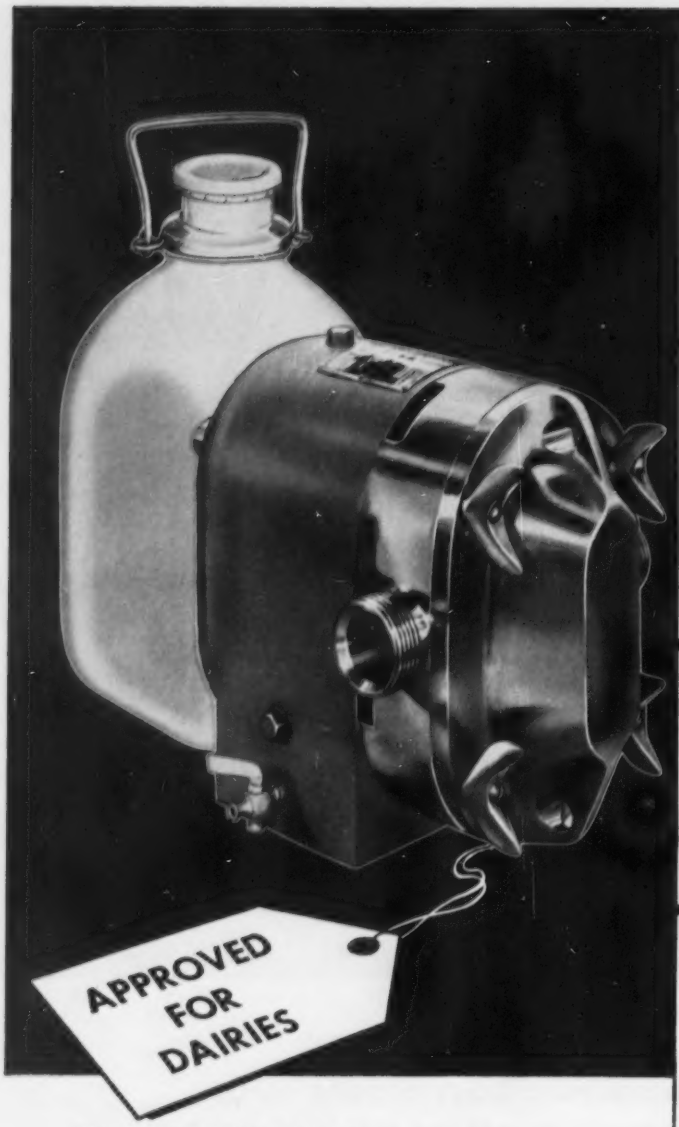
Carnation also used this unique cellular glass insulation for all other walls plus the floor and ceiling of the room. Its sealed glass cells mean FOAMGLAS stays dry, its insulating performance stays constant. That assures dependable temperature control and an end to the headaches and expense of insulation replacement. What's more, heavy loads can't hurt the extra-strong floor insulation.

You, too, will find this unique, *stay-dry* insulation the perfect answer for refrigerated spaces, piping and equipment. Completely inorganic, FOAMGLAS can't warp, shrink or swell . . . is vermin-proof and fireproof as well. Write us today for a free sample and up-to-date literature covering your specific needs.

Pittsburgh Corning Corporation
Dept. O-56, One Gateway Center
Pittsburgh 22, Pennsylvania
In Canada: 57 Bloor St. W., Toronto, Ontario

With this simple test you can quickly demonstrate for yourself the remarkable compressive strength of FOAMGLAS (over 7 tons per square foot). Write now for a free sample and complete directions for this and five other simple tests . . . easily performed right in your own office.

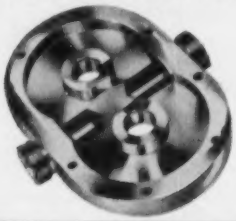
Pittsburgh Corning also manufactures PC Glass Blocks



WHY IS THE WAUKESHA PUMP A SANITARY PUMP?

Easy To Disassemble and Reassemble — A minimum number of parts.

Easy To Clean . . . Wash . . . Sterilize—Smooth, polished surfaces. No cracks or crevices for bacteria to form. No hard-to-clean recesses.



Exclusive Waukesha Sanitary O-Ring Seal Smooth surfaced. Easy to clean. Flips out at touch of a simple ingenious tool. Seals out air . . . seals product in . . . no leakage!

Corrosion-Resistant Metal . . . No Product Contamination—The right metal for the product being pumped. Also, gleaming polished exterior . . . easy to keep clean.

a SANITARY pump must be what it says

A sanitary pump for dairies must be simple and easy to clean and sterilize, inside and out . . . and one in which the metal will not contaminate the milk, cheese or ice cream. The Waukesha sanitary pump meets the rigid demands of good sanitary practices . . . and meets sanitary code standards with flying colors.

Besides, not only is the Waukesha pump a sanitary pump . . . it is P.D.*, too! The positive displacement action provides smooth product flow . . . without damage to the product . . . without aeration . . . without turbulence.

So whenever you need a QUALITY P.D. Sanitary Pump—remember Waukesha—and the exclusive sanitary O-Ring Seal! Many satisfied users attest to its fine performance. For complete details, write to the Waukesha Foundry Company, Dept. 5A, Waukesha, Wisconsin.

Waukesha Foundry Company

WAUKESHA—the Forward Look in Pumps. Yesterday, Waukesha Pioneered the Sanitary P.D. Pump. Today, Waukesha Pioneers the Improvements.

*Positive Displacement

Call Your Distributor and get

DOUBLE SERVICE with BARRETT® BRAND Cylinder Anhydrous Ammonia

● *CONTACT* your distributor (listed below) for *fast* delivery of Barrett Standard Anhydrous Ammonia in cylinders.

CALIFORNIA
Los Angeles: Nitrogen Div. Allied Chemical & Dye Corp. 2999 West 6th St.
San Diego: Gould Hardware & Machinery Co. 700 E. Harbor Dr.
San Francisco: Nitrogen Div. Allied Chemical & Dye Corp. 1095 Market St.

COLORADO
Denver: Mine & Smelter Supply Co. 1422-17th St. P. O. Box 5270

CONNECTICUT
W. Hartford: The Christian Petersen & Son Co., 26 Brook St. P. O. Box 247

FLORIDA
Jacksonville: D. W. Anderson 615 E. Bay St. P. O. Box 1346
Miami: Columbia Chemical & Supply Co., 7430 N.E. 4th Ct. P. O. Box 967
Tampa: Food Equipment & Supply Co., 1809 2nd Ave. P. O. Box 422

GEORGIA
Macon: The Anderson Chemical Co., Inc., 1620 Waterville Rd. P. O. Box 1424

ILLINOIS
Chicago: Westland Engineering Supply Co., 53 W. Jackson Blvd.

IOWA
Burlington: McKesson & Robbins, Inc., West Central District Off. 100 N. 4th St. P. O. Box 591
Cedar Rapids: McKesson & Robbins, Inc., Cedar Rapids Div. 900 2nd St., S.E.
Ottumwa: J. W. Edgerly & Co. 120 W. Main St.
Sioux City: McKesson & Robbins, Inc., Sioux City Div. 308 Pearl St.

KANSAS
Wichita: Reid Supply Co. 306 W. 2nd St.

KENTUCKY
Henderson: P. B. & S. Chemical Co. 1100 N. Adams St.
Louisville: Griffin Chemical Co. 528 Franklin St.

LOUISIANA
New Orleans: Sam Reisfeld & Co. 403 Queen & Crescent Bldg.

MAINE
Portland: Acme Engineering Co. 46 Market St.

MARYLAND
Baltimore: Leidy Chemicals Corp. 920 S. Eutaw St.

MASSACHUSETTS
Attleboro: Reynolds & Markman, Inc., 88 Union St.
Springfield: The Chemical Corp. 54 Waltham Ave.
West Springfield: Barker Chemical Co., 101 Circuit Ave. P. O. Box 173
Worcester: Brewer & Co., Inc., Ind. Chem. Div., 45 Arctic St.

MICHIGAN
Detroit: Eaton Chemical & Dyestuff Co., 1490 Franklin St.

MINNESOTA
St. Paul: Lyon Chemicals, Inc. 2305 Hampden Ave.

MISSOURI
Kansas City: Abner Hood Chemical Co., 507-517 N. Montgall Ave.
St. Louis: Nitrogen Div. Allied Chemical & Dye Corp. 4528 South Broadway
St. Louis: McKesson & Robbins, Inc., Chemical Div., 904 Landreth Bldg., 320 N. 4th St.
St. Louis: G. S. Robins & Co. 126 Chouteau Ave.

NEBRASKA
Omaha: McKesson & Robbins, Inc. Omaha Div., 902 Farnam St.

NEW JERSEY
Edgewater: Nitrogen Div. Allied Chemical & Dye Corp. 1 River Road
Paterson: Lotte Chemical Corp. 109 - 5th Ave.
Paterson: Seaboard Industries 195 Keen St.
Paterson: Wollen Chemical & Supply Co., 126 6th Ave. P. O. Box 1659

NEW YORK
Albany: Albany Laboratories, Inc. 67 Howard St.
Bklyn: Tex-Ite Products Corp. 885 Flatbush Ave.
Buffalo: Commercial Chemicals, Inc. 211 Hertel Ave.
New York: Nitrogen Div. Allied Chemical & Dye Corp. 40 Rector St.
New York: N. H. Heyman, Inc. 168 E. 91st St.
New York: E. M. Sergeant Pulp & Chemical Co., 7 Dey St.
Poughkeepsie: Duso Chemical Co., Inc., Fulton & Fairview St. P. O. Box 665
Rochester: Wm. B. Duffy Carting Co., 62 Scio St.
Syracuse: Gleason Materials & Equipment Co., Inc., 424 Hefferman Bldg., 205 Harrison St.

NORTH CAROLINA
Charlotte: American Cyanamid Co. 3333 Wilkinson Blvd.

OHIO
Cleveland: Harshaw Chemical Co. 1945 E. 97th St.
Cincinnati: Harshaw Chem. Co. 6265 Wiehe Rd.
Cincinnati: Wirthlin-Mann Co. 1930 Dana Ave. P. O. Box 56

OKLAHOMA
Okla. City: Rex Engineering & Sales Co., 2735 N.W. 10th St. P. O. Box 5141
Tulsa: Vaughn Chemical Co. 1102 E. 3rd St.

PENNSYLVANIA
Altoona: Western Pennsylvania Chem. Co., Inc., 4125-41 6th Ave. P. O. Box 703
Pittsburgh: Thomas Knoch 244 Bascom St.

RHODE ISLAND
Providence: T. H. Baylis Co. 42 Gano St.

TENNESSEE
Memphis: The Lilly Co., 466 Union Ave.

TEXAS
Dallas: Chas. H. Platter & Co. Texas Bank Bldg.
El Paso: George S. Thompson Co., Inc., 611-615 N. Campbell St.
Houston: Goldsmith-Sanders 756 M & M Bldg.
San Antonio: Interstate Brokerage Co., 411 No. Medina St. P. O. Box 4497 Station "A"

UTAH
Salt Lake City: Mine & Smelter Supply Co., 121 W. 2nd St., South P. O. Box 1348

VIRGINIA
Richmond: Phipps & Bird, Inc. 303 S. 6th St.

WEST VIRGINIA
Charleston: B. Preiser Co., Inc. P. O. Box 6118

WISCONSIN
Milwaukee: Benio Chemicals 1907-25 S. 89th St.

PROMPT DELIVERY of a reliable product is always desirable. And when delivery and reliability are backed up by both your local dealer and a nationwide service force, your service is *doubly good.*

THIS IS WHAT you get when you order Barrett Brand Anhydrous Ammonia. Not only do you get a product made by America's largest producer of high-purity, extra-dry Ammonia, but you get service from a local distributor.

YOUR LOCAL DISTRIBUTOR is an independent firm whose livelihood depends on his personal service to you, backed by the staff, experience and facilities of Nitrogen Division. He can help you solve any technical problems you may have. He will also provide you with the type of service you want. Call him today!

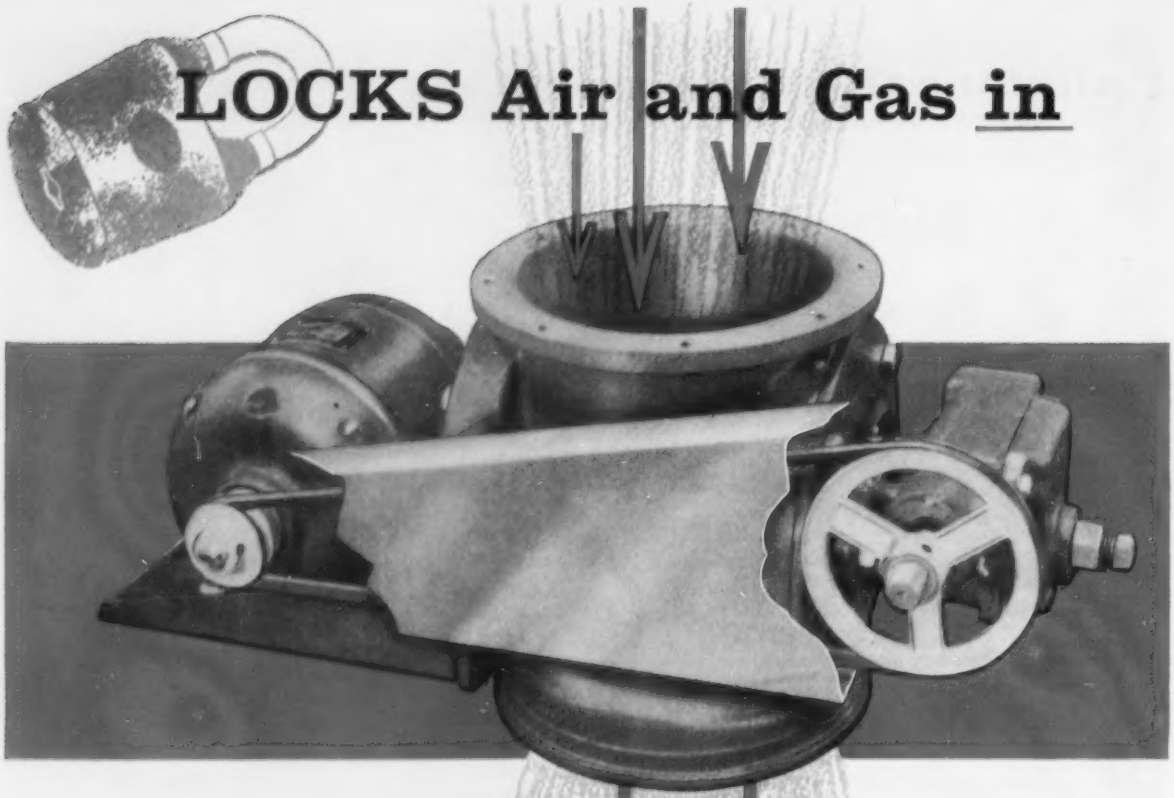
Allied Chemical — NITROGEN DIVISION

40 Rector Street, New York 6, N. Y.

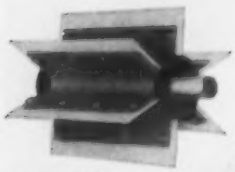
Hopewell, Va. • Ironton, Ohio • Orange, Tex. Omaha, Neb.

For more data, circle this page number on card at back →

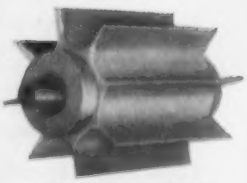
LOCKS Air and Gas in



–FEEDS Materials out!

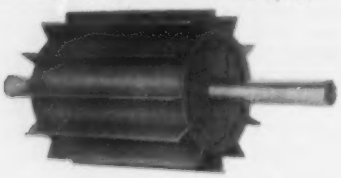


6-VANE ROTOR
with plastic, rubber, or other replaceable vanes.



12-VANE ROTOR
designed for use as a feeder, furnished with carbon steel cylinder and brass blades. Other metals available.

SOLID 8-VANE ROTOR
furnished in cast iron, bronze, stainless steel, monel, etc.



The MIKRO Rotary Airlock provides an ideal method of feeding free-flowing materials under pressure or vacuum, while sealing in air or gas from passing on with the material.

A precision-built rotary valve, the MIKRO Airlock continuously feeds materials from an upper chamber into a lower one by gravity. The vanes of its rotor provide a seal which prevents leakage of air or gas from the upper chamber into the lower chamber, or into the atmosphere.

Applications of the MIKRO Rotary Airlock are many and extremely varied. It can be used at the discharge of a pulverizer or a dust collector. It can also be used on the discharge of a blender or mixer to regulate the flow of material from the unit. It can likewise be used as a feeder to control the rate of flow from a storage bin or hopper, or as a feeding mechanism to a pulverizer, a pneumatic conveying system, mixer or blender.

The MIKRO Airlock is available for low or high pressure use, with capacities varying from 100 to 15,000 lbs. per hour depending upon rotor speed and density of material handled. Furnished with various types of rotors and vanes to meet specific requirements.

SEND FOR new MIKRO Rotary Airlock Bulletin

Mikro-D

PULVERIZING MACHINERY DIVISION
METALS DISINTEGRATING COMPANY, INC.
97 CHATHAM ROAD **SUMMIT, NEW JERSEY**

PULVERIZING • AIR CONVEYING • DUST COLLECTING EQUIPMENT

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

Three Methods of Measuring Salt—and Their Effects on Brine Uniformity

One of the most important factors in maintaining brine strength at consistently uniform levels is salt measurement. When measurement is inaccurate, brine may be weakened excessively or become too strong. But, when salt is measured accurately, variations in brine strength are virtually eliminated . . . brine production costs are reduced . . . and product quality remains high.

Today, there are three methods commonly used to measure salt in industry. While all of these have certain merits, only one method is completely accurate—measuring salt quantity in the form of saturated brine. A look at the other two methods will show why they are not entirely reliable.

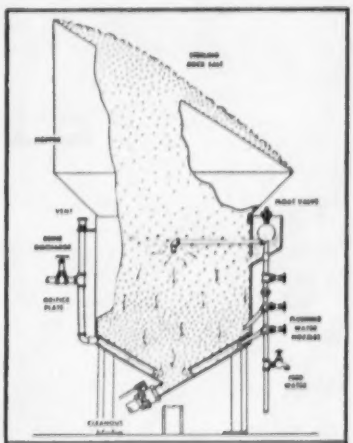
Measurement by dry salt volume. This method presents a number of difficulties. First, moisture content of salt can greatly affect its volume. And humidity changes alter this moisture content to a considerable degree. Degree of compaction makes a big difference in volume, too. A pailful of salt may vary from 25 to 35 lb. (a 40% margin of error) depending on storage conditions, or length of storage. Both moisture content and compaction will change, not only from one day to the next—but also from one batch of salt to another.

Measuring by dry salt weight. This method is somewhat more reliable, but is still far from accurate. When the scale reads 100 lb., it can never be estimated how much of that weight is moisture—one pound or ten. And again, the moisture content of salt varies constantly with air humidity, and humidity of storage areas. When salt is measured this way, control over brine strength is never exact.

Measurement by the saturated brine method. This is effective in every industrial application. It depends, of course, on fully saturated, crystal-clear brine, free from any undissolved solids. One gallon of such brine always contains 2.65 lb. of salt (if dissolution water temperature is within the range found in most plants). By starting with this accurate fixed unit of salt measurement, brine strength can be completely controlled. Whatever strength is desired—the dilution of fully saturated brine with a certain amount of water produces it quickly and accurately.

One of the best ways to get the fully saturated brine essential to this measuring method is with a Lixate Rock Salt dissolver. This device—originated by International—automatically produces clear, fully saturated brine from Sterling Rock Salt. In fact, development of the Lixator made possible accurate salt measurement.

Regulating brine strength with the Lixator: Water is run into storage tank up to a specified mark. Lixate Brine is then added to bring the volume up to another mark. The mixture of water and Lixate Brine will give the exact strength of dilute brine needed—as well as the correct volume.



The Sterling Lixator reduces salt-handling, brine-making and brine-distributing costs. Savings between 10% and 20% on salt used are possible, too.

This method of salt measurement and brine control, of course, does more than protect product quality. It also provides substantial savings in time and labor—since the entire Sterling Lixator operation is fully automatic.

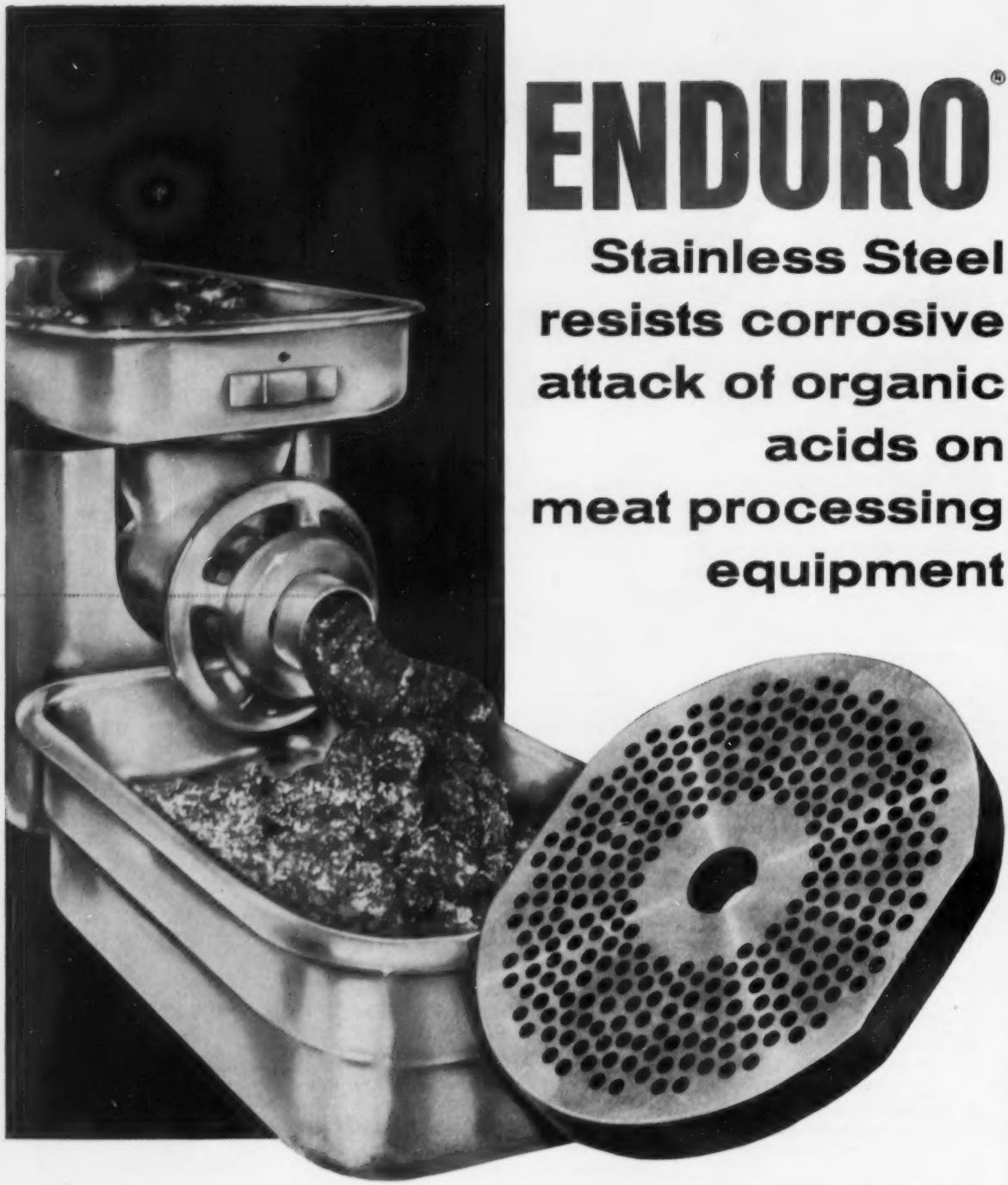
TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all grades. We also make automatic dissolvers in metal or plastic for both types of salt. So we can suggest the type and grade of salt most perfectly suited to your needs.

If you'd like help on any problem concerning salt or brine—or further information on salt measurement—contact your nearest International sales office.

International Salt Co., Scranton, Pa.
Sales offices: Atlanta, Chicago, New Orleans, Baltimore, Boston, Detroit, St. Louis, Newark, Buffalo, New York, Cincinnati, Cleveland, Philadelphia, Pittsburgh, Richmond.

FOR INDUSTRY, FARM, AND THE HOME—
STERLING SALT
PRODUCT OF INTERNATIONAL SALT CO., INC.



ENDURO®

Stainless Steel resists corrosive attack of organic acids on meat processing equipment

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Corrosion, caused by meat and fish acids, has always been a serious problem for meat packing plants, locker plants, hospitals, hotels, institutions, markets . . . and any other place where cleanliness, sanitation and appearance are absolute musts.

Because meat and fish acids are organic, they readily attack ordinary materials used in fabricating meat processing equipment. The Biro Manufacturing Company, Marblehead, Ohio, has licked the corrosion problem with the help of Republic ENDURO Stainless Steel.

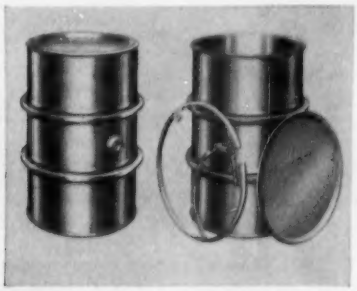
All parts in their line of power meat cutters and choppers coming in contact with meat or fish, like the chopper plate shown at left, are fabricated from ENDURO. This means that corrosion is locked out. ENDURO's smooth, hard surface offers little foothold for contaminants or bacteria. ENDURO is solid stainless steel all the way through with no applied surface to crack, chip, flake or peel away.

Ease of cleaning is another advantage of ENDURO-made meat processing equipment. Usually a simple washing with soap and water rids the equipment of all residue and readies it for the next operation. And there's never any danger of metallic contamination. ENDURO never adds unwanted flavor. It never takes anything away.

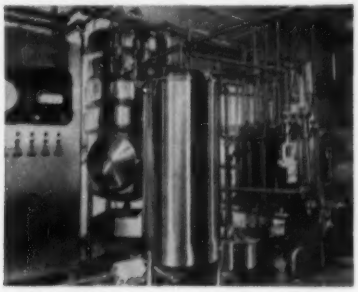
ENDURO in any food processing operation means long-range economies. It will take persistent abuse and still maintain its sanitary appearance, strength and corrosion-resistance. Your equipment supplier has all the facts on how ENDURO can cut your maintenance costs and safeguard the quality and purity of your product. Or send the coupon for more information.

THE WORLD'S FIRST Stainless Steel Power Meat Cutter was made from ENDURO by The Biro Manufacturing Company. It features maximum resistance to corrosion and provides all types of meat processing operations with absolute sanitation and the finest appearance.

WHAT'S EVEN MORE CORROSION-RESISTANT than stainless steel? Republic Titanium. It is practically immune to the corrosive effects of salt water. This could mean tremendous savings for meat processors and food packers using salt or brine. Republic is working closely with equipment manufacturers on new developments utilizing all the advantages of Titanium. Write us for more information.



MAXIMUM PROTECTION AGAINST CORROSIVE ATTACKS on food products in transit or in storage is provided by Republic ENDURO Stainless Steel Barrels and Drums. There's no danger of contamination or discoloration. ENDURO Barrels and Drums will withstand hard use and abuse. They resist denting and never need painting. Available in 30- and 55-gallon capacities.



CORROSION IS HELD IN CHECK by Republic ELECTRUNITE® Stainless Steel Tubing and Pipe. And, because they are corrosion-resistant and have a wide range of resistance to temperature, pressure and physical damage, they will last indefinitely. You receive positive assurance that there will be no contamination or discoloration of food, beverages or dairy products transported through ELECTRUNITE Stainless Steel Tubing and Pipe.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-1782
3160 East 45th Street
Cleveland 27, Ohio

Send more information on these Republic Products for food processing.

☐ ENDURO Stainless Steel
☐ ENDURO Barrels and Drums ☐ Titanium
☐ ELECTRUNITE Stainless Steel Tubing and Pipe

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

For more data, circle this page number on card at back →

YOU CAN MAKE THESE 6 VINYLS SAFER AND BETTER AT LOW COST!

VINYL CROWN LINERS with a definite advantage in pressure retention over cork liners...

VINYL COATED CONTAINERS —that are nontoxic and can be used for all hot or cold foods and liquids...

VINYL PLAYPEN TOYS —that are nontoxic... safe for baby to teethe on...

FOOD JAR VINYL SEALING RINGS that are fast and easy to manufacture...safe for contact with both fatty and nonfatty foods...

VINYL FILM PACKAGES —excellent for meat wrappings and new type of single portion, ready-to-use food packages...

POLYVINYL ACETATE ADHESIVES that increase production rates several hundred per cent over ordinary pastes and glues and meet F.&D.A. requirements for food packaging.

WITH PFIZER CITROFLEX® A-4... nontoxic, odorless plasticizer

Citroflex A-4 is accepted by the Food and Drug Administration, the Bureau of Animal Industry, and the Office of the Quartermaster General as a component of plastic film wraps **for both fatty and nonfatty foods.** Its toxicological safety is unsurpassed.

It's odorless, and it makes vinyls outstandingly low in extractable taste, too.

It has excellent viscosity stability and superior heat stability in polyvinyl chloride plastisols... **unusual efficiency** as plasticizer for synthetic resin adhesives and polyvinyl chloride coatings for paper board products. Lower amounts are needed than with other plasticizers to achieve the same heat-sealing temperatures.

Vinyl coatings formulated using Pfizer Citroflex A-4 have **high gloss finishes.**

Manufacturing Chemists for Over 100 Years

Pfizer

CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas

High Speed Reduction to Micron Sizes — No Attritional Heat!

ENGINEERING FLUID-JET GRINDING IN "PACKAGE UNITS"

. . . comes naturally to Sturtevant engineers — with their 75-year tradition of successful solving of dry-processing problems. If you want to accomplish the most effective grouping of a Micronizer* Grinding Machine with necessary compressor, feeder and dust-collector, it will pay you to investigate. Check the coupon on the right for more information.

Sturtevant Micronizer* Grinding Machines Give Greater Finenesses than Tube or Roller Mills

Look at the record! 30 inch model reduced titanium dioxide to 1 micron and finer at solid feed rate of 2250 lbs. per hr. 24 inch model reduced DDT (50%) to 3.5 average microns — 1200-1400 lbs. per hr. 8 inch model reduced Procaine—Penicillin—to 5 to 20 microns—up to 20 lbs. per hr. Couldn't you use milling performances like these?

No moving parts. The particles grind each other. High-speed rotation and violent grinding impact of particles are caused by jets of compressed air or steam at angles to the periphery of the shallow grinding chamber. There are no problems of attritional heat. Centrifugal force keeps over-sized particles in the grinding zone. Cyclone action in the central section classifies and collects the fines for bagging.

Instant accessibility, easy cleaning. Micronizer* Grinding Machines come in seven sizes — each one constructed for quick accessibility and easy maintenance (typified by the "OPEN DOOR" design in other Sturtevant equipment). Grinding chambers range from the 2 in. laboratory size with ½ lb. per hr. capacity to the 30 in. size which handles up to 3000 lbs. per hr.

* Registered trademark of Sturtevant Mill Co.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are: _____

Desired capacity is: _____

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

STURTEVANT MILL COMPANY 106 Clayton Street, Boston 22, Mass.

Please send me your Micronizer* Bulletin ☐
Also bulletins on machines for:

☐ CRUSHING ☐ GRINDING ☐ PULVERIZING
☐ SEPARATING ☐ BLENDING ☐ MIXING
☐ SUPERFINE SELECTING ☐ GRANULATING ☐ CONVEYING

For more data, circle this page number on card at back →

Stimulate the urge to buy

Polyethylene laminate package for Kraft Cheese is supplied by Shellmar-Betner Flexible Packaging Division, Continental Can Co., Mt. Vernon, Ohio.

"big help in marketing natural fresh foods"

"Take our Natural Sliced Swiss Cheese," cites John B. McLaughlin, Director of Sales and Advertising, Kraft Foods Company, Chicago, Ill., "In its new polyethylene-cellophane laminate bag, the natural flavor is truly retained. The moisture and vapor-tightness of the package keeps pre-sliced cheese free from hardening. And the printed package makes a better display and is easier to handle for storekeeper and customer." Those are certainly advantages that stimulate the urge to buy, both by retailers and consumers! For more information write Dept. NQ-63 for "Processed Foods" Booklet.

BAKELITE Vinyl Resins are used to coat these "Nestyte" containers by Sealright Company, Inc., Fulton, New York.

flavor-fresh protection for frozen soups

BAKELITE Brand Vinyl Resins provide a coating on the interior and exterior of these "Nestyte" containers. It's uniform, tough and flexible . . . no cracking, flaking, peeling or chipping. No flavor contamination, no messy storage shelves, no extra clean-up time on packaging and dispensing. This container can even be washed and reused for food storage! And it permitted Seiler Foods, Inc., Boston, Mass., to "completely automatize our packaging operation," according to Dana K. Seiler, president.

BAKELITE Vinyl Resin coatings give paper, cardboard, foil, and closures high resistance to water, fatty oils, food chemicals, and acids. They make a bright sparkling package that people look at, pick up, and put down their money for, because they can rely on the freshness inside. For more information write Dept. NR-63 for "1956 Guide to Packaging."

It pays to specify . . .

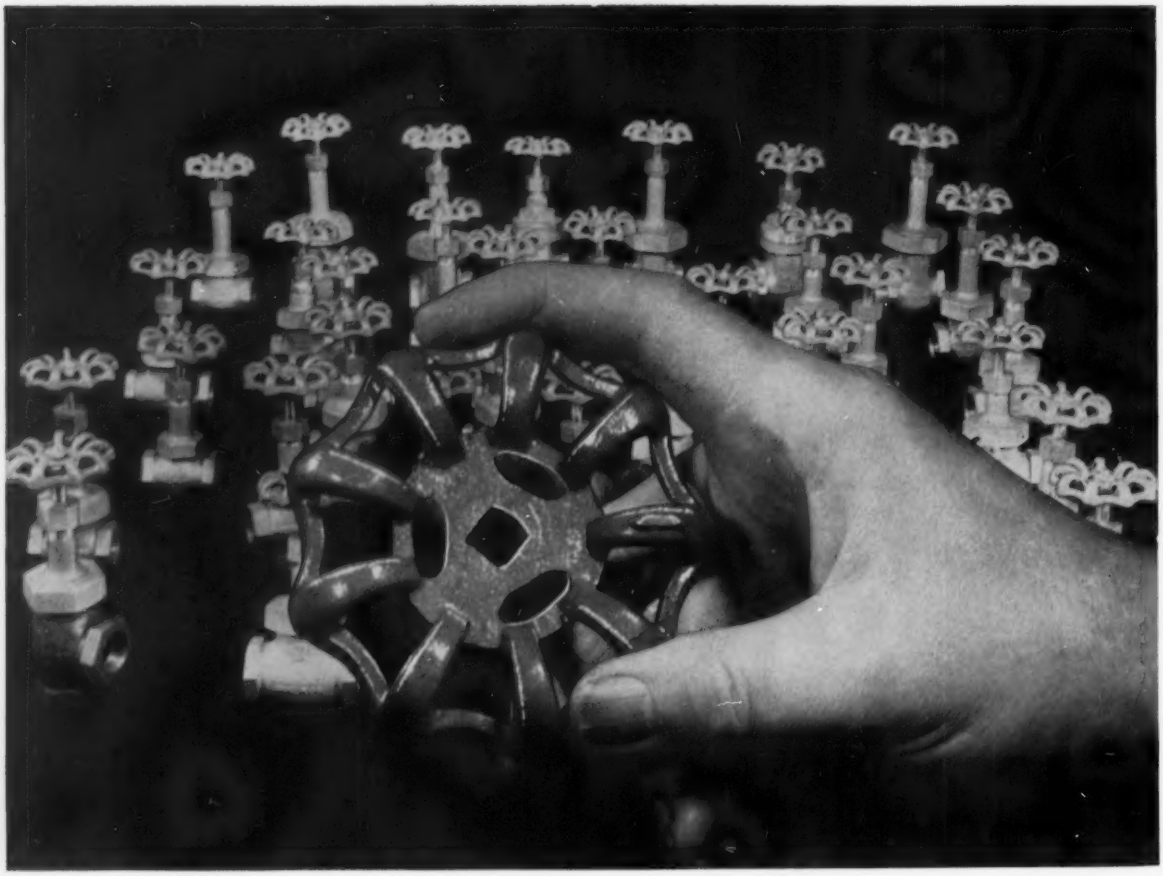
BAKELITE
BRAND
PLASTICS

BAKELITE COMPANY

A Division of Union Carbide and Carbon Corporation UCC

30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC



One handwheel fits 40* different valves

*Walworth Handwheel No. 16 fits these Walworth Bronze Valves:	
¾"	No. 32, 40, 47, 48, 205, 206, 225P, 227P, 260, 261, 260P, 261P
1"	No. 29, 30, 36, 37, 91, OX91, 92, 95, 96, 160, 161, 235, 236, 245, 246, 245P, 246P, 237P, 238P
1¼"	No. 58, 59
1½"	No. 2, 3, 4, 11, 12, 14, 24

Only Walworth Bronze Valves give you this degree of interchangeability

With standardized Walworth Bronze Valve parts you maintain the greatest number of valves with the smallest inventory of basic parts. Handwheels are just one example. Fourteen different sizes of handwheels are all you need for fifty lines of gate, globe, and angle valves, involving 420 individual valves.

The Walworth system of interchangeability of parts for Bronze Valves is unsurpassed by any manufacturer in the field. In addition to Bronze Valves, Walworth produces valves and pipe fittings of iron, steel, special alloys, and rigid polyvinyl chloride (PVC).

Learn more about Walworth interchangeability. Contact your local Walworth Distributor or nearby Walworth Sales Office. Ask for literature.

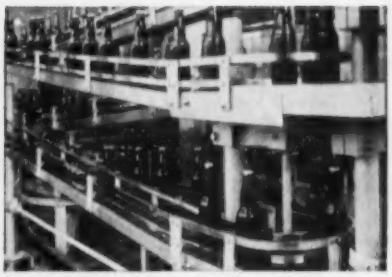
WALWORTH

60 East 42nd Street, New York 17, New York

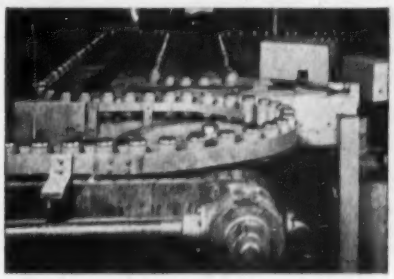
SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. · CONOFLOW CORPORATION · M & H VALVE & FITTINGS CO. · SOUTHWEST FABRICATING & WELDING CO., INC. · WALWORTH COMPANY OF CANADA, LTD.

For smooth, economical conveying-- carry it on Link-Belt flat-top chain

EASY-TO-CLEAN Link-Belt S-815 flat-top chain conveyor moves baby food jars smoothly during careful inspection at this Michigan plant.



VERTICAL OR HORIZONTAL CURVES offer no problem for universal crescent flat-top chain.



SMOOTH HANDLING is assured as RC flat-top chain carries jars through filling and capping operations.

Choose from many types of LINK-BELT carrying chain

WHETHER you're handling baby food or beverages—cartons or cans—there's *one* chain in the complete Link-Belt line that will meet your exact needs. The chains pictured above, for example, are only three of many types of Link-Belt flat-top chain.

Link-Belt also builds a variety of cast, combination, forged and fabricated steel chains. They're available with a wide range of attachments for specialized services.

As for drive chain on your food handling machinery, Link-Belt offers an equally broad range of types, including roller and silent chain. High or low speeds . . . heavy shock loads or moderate duty—you'll find the right answer in Link-Belt chain.

There are Link-Belt offices in every principal industrial area. Call the one near you for an impartial analysis of your drive or conveying chain needs.

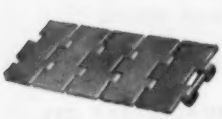
LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13.090

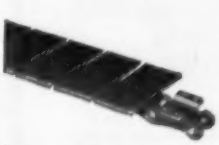
No one chain serves every purpose . . . get the RIGHT one from Link-Belt's complete line



S-815 flat-top conveyor chain—economical, sturdy, reliable, easy to detach and to keep clean.

Class RC universal crescent flat-top chain for multi-plane operation in a variety of paths.

Class RC crescent flat-top chain—travels in horizontal planes and around corners.

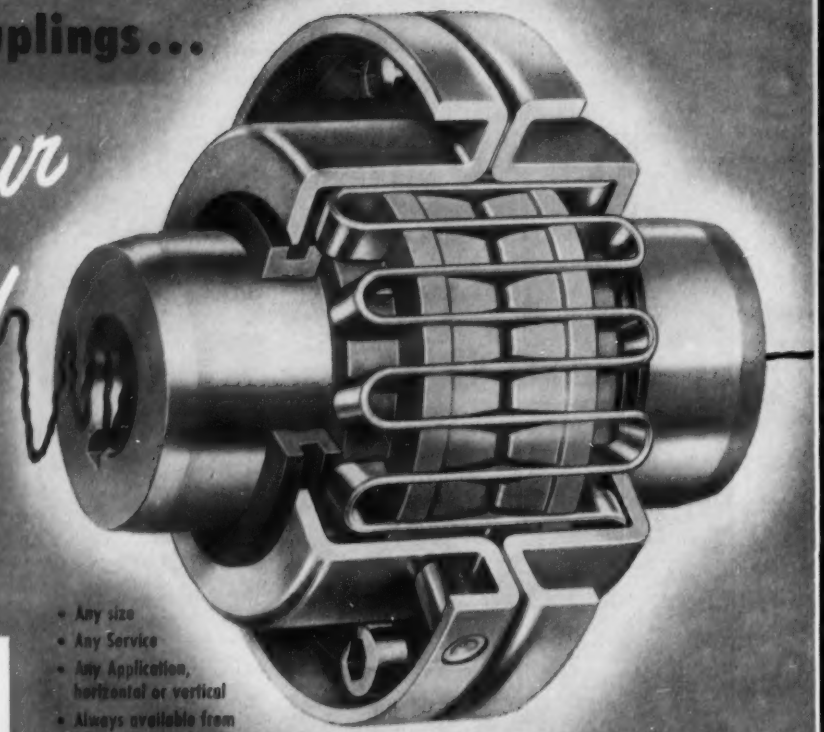


Class RC flat-top chain—precision made for smoothest, spill-free carrying and long life.

Class 400 swivel chain—carries cartons, cases, etc. over paths with both vertical and horizontal turns.

Falk Steelflex Couplings...

Protect your machinery in 2 ways



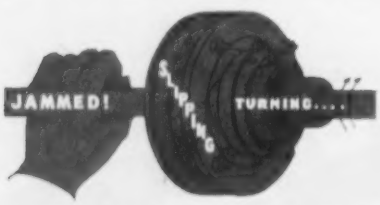
- Any size
- Any Service
- Any Application, horizontal or vertical
- Always available from factory, field or distributor stocks

Falk Controlled Torque Couplings prevent damage from overloads

In applications where danger from overloads exists, use the FALK Type FT Controlled Torque Coupling. The Type FT has all the features and advantages of standard FALK Steelflex couplings—and, in addition, has an adjustable friction slip clutch, enabling the operator to set the coupling to slip at any predetermined overload.

This controlled-torque principle not only prevents transmission of dangerous shocks and limits overloads; it eliminates the breaking of shafts caused by jamming of driven equipment.

An outstanding advantage of the Type FT Coupling is that, as soon as the cause of the overload is removed, the entire coupling will rotate and transmit power without replacing parts or repairing coupling.



There's real economy in using Type FT Controlled Torque Couplings. Many users have reported that these couplings paid for themselves the very first time they slipped (under overload) because of the protection against damaged driving or driven machinery!

...cost less per year of service!

You get *double protection* when you connect your driving and driven machinery with a Falk Steelflex Coupling—the all-steel coupling with the exclusive grid-groove design! First, its *torsional resilience* smothers shock and vibration; and second, the Steelflex design prevents damage and lowered efficiency by accommodating shaft misalignment.

Why have increasing numbers of key men in industry standardized on Falk Steelflex Couplings? Their experience has proved that Falk Steelflex Couplings prolong the service life of their machinery... are trouble-free and need minimum maintenance... are easy to install, lubricate and disconnect... and *cost less per year of service* than ordinary couplings.

One basic Steelflex design—the type F, in its many sizes—is adaptable to more than 90% of all industrial applications. For applications involving danger from overloads, Modified Type FT Controlled Torque couplings (see column at left) are ideally suited. There are numerous other special or dual purpose Steelflex couplings for unusual applications. **Write to Department 247** for engineering bulletin, including selection and dimension tables.

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

FALK

...a good name in industry

MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

DOW PROPYLENE GLYCOL, U. S. P.

THE SOLVENT TO IMPROVE FLAVOR PRODUCTS

. . . has become an accepted standard for flavors, extracts and flavor concentrates

Watch those eyes light up—when your flavor product is made with Dow propylene glycol, U.S.P. Add this flavoring advantage to economy of manufacture made possible with this efficient Dow solvent, and you have two excellent reasons to specify it for your own use.

Remarkable savings have been achieved—with only minor reformulation—by many makers of food colors who replaced other solvents with propylene glycol.

Then there's dependable quality and prompt delivery of Dow propylene glycol, U.S.P. . . . something you can depend on to simplify your own production problems. A free sample and property information are yours for the asking from THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. OC 853H.

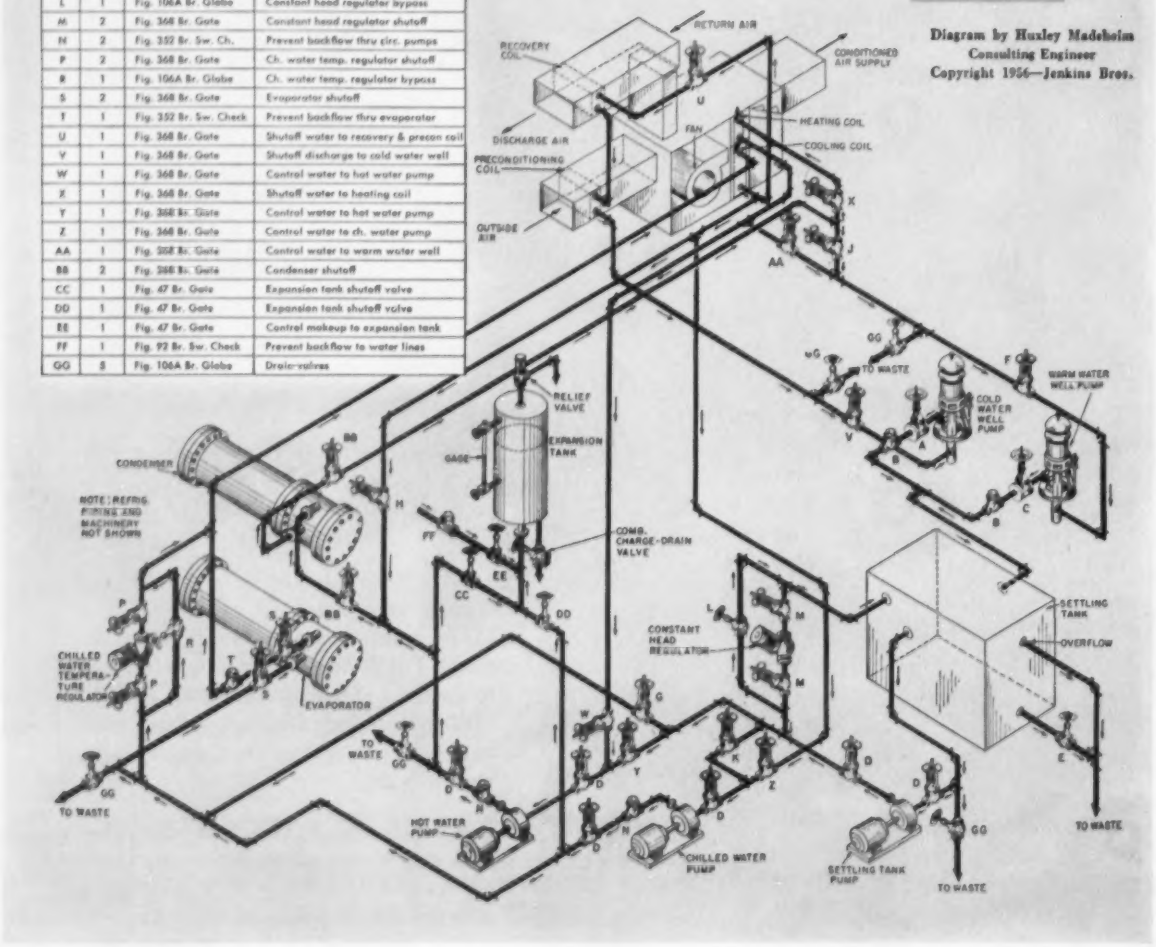
you can depend on DOW CHEMICALS

JENKINS PRACTICAL PIPING LAYOUTS

77

Diagram by Huxley Madeheim
Consulting Engineer
Copyright 1956—Jenkins Bros.

Code	Quan.	Jenkins Valve	Service
A	1	Fig. 677A Br. Gate	Cold water well shutoff valve
B	2	Fig. 293 Br. Sw. Check	Prevent backflow thru well pumps
C	1	Fig. 677A Br. Gate	Warm water well shutoff valve
D	6	Fig. 368 Br. Gate	Circ. pump shutoff valves
E	1	Fig. 106A Br. Globe	Settling Tank drain valve
F	1	Fig. 368 Br. Gate	Shutoff discharge to warm water well
G	1	Fig. 368 Br. Gate	Control water to evaporator
H	1	Fig. 368 Br. Gate	Control water to condenser
J	1	Fig. 368 Br. Gate	Control water to warm water well
K	1	Fig. 368 Br. Gate	Control water to ch. water pump
L	1	Fig. 106A Br. Globe	Constant head regulator bypass
M	2	Fig. 368 Br. Gate	Constant head regulator shutoff
N	2	Fig. 352 Br. Sw. Ch.	Prevent backflow thru circ. pumps
P	2	Fig. 368 Br. Gate	Ch. water temp. regulator shutoff
R	1	Fig. 106A Br. Globe	Ch. water temp. regulator bypass
S	2	Fig. 368 Br. Gate	Evaporator shutoff
T	1	Fig. 352 Br. Sw. Check	Prevent backflow thru evaporator
U	1	Fig. 368 Br. Gate	Shutoff water to recovery & precon coil
V	1	Fig. 368 Br. Gate	Shutoff discharge to cold water well
W	1	Fig. 368 Br. Gate	Control water to hot water pump
X	1	Fig. 368 Br. Gate	Shutoff water to heating coil
Y	1	Fig. 368 Br. Gate	Control water to hot water pump
Z	1	Fig. 368 Br. Gate	Control water to ch. water pump
AA	1	Fig. 368 Br. Gate	Control water to warm water well
BB	2	Fig. 368 Br. Gate	Condenser shutoff
CC	1	Fig. 47 Br. Gate	Expansion tank shutoff valve
DD	1	Fig. 47 Br. Gate	Expansion tank shutoff valve
EE	1	Fig. 47 Br. Gate	Control makeup to expansion tank
FF	1	Fig. 92 Br. Sw. Check	Prevent backflow to water lines
GG	8	Fig. 106A Br. Globe	Drain valves



How to plan piping connections for all-year

AIR CONDITIONING WITH THE HEAT PUMP

Well water is used in the basic heat pump installation illustrated. Such a system could readily serve a building with several exterior and interior zones, which would have many air handling units. For simplicity, only one unit is shown in the diagram.

For heating demands, this system provides a closed circuit consisting of hot water pump, condenser, and heating coil. For cooling, a second closed circuit consists of chilled water pump, evaporator, and cooling coil.

During the heating season, water is supplied to the settling tank from the warm water well (about 60° F). It is circulated by the chilled water pump to the evaporator, and then to the cooling coil to provide cooling, where needed, for interior areas. The water then flows to the recovery coil, picks up heat from waste air and carries it to preconditioning coil, where it is used to preheat outside air. The resulting chilled water is discharged to the cold water well.

During the intermediate seasons, water is supplied to the settling tank from the cold water well (about 50° F). It is circulated by the hot water pump to the condenser, and then to the heating coil to provide heat, where needed, for the exterior zones. The water is then discharged to the hot water well.

During the cooling season, water from the cold water well is pumped to the settling tank, and then circulated to the evaporator and the cooling coils. It is next used to cool the condenser, and is then discharged to the hot water well. If the demand for cooling is low, and the well water cold enough, the evaporator may be bypassed.

Consultation with accredited piping engineers and contractors is recommended when planning major piping installations.

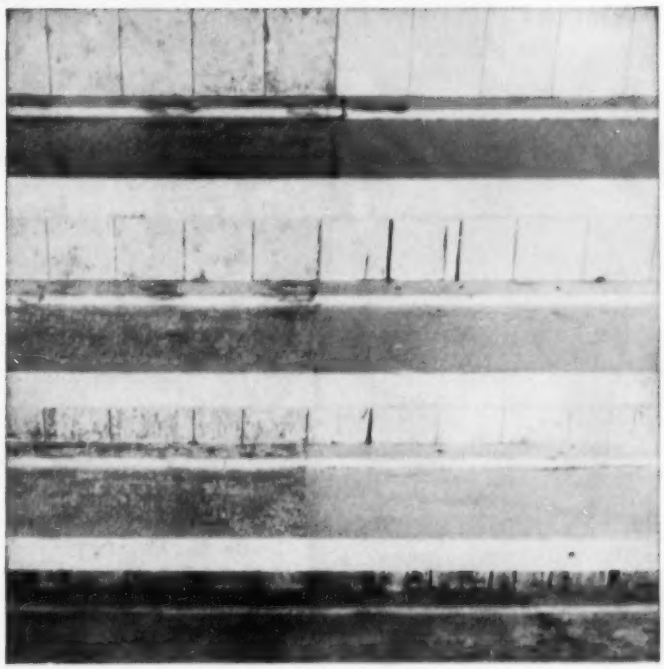
Enlarged diagram and full description of this layout free on request. Ask for Layout No. 77. Jenkins Bros., 100 Park Ave., New York 17.

JENKINS VALVES
LOOK FOR THE JENKINS DIAMOND
SOLD THROUGH PLUMBING-HEATING AND INDUSTRIAL DISTRIBUTORS

NEW DU PONT ODORLESS MILDEW-RESISTANT ENAMEL

solves mildew problem in hundreds of food plants

Food-plant managers across the country have found that Du Pont Odorless Mildew-Resistant Enamel Oyster White retards the growth of most types of mildew on walls and ceilings. Formulated with solubilized copper-8-quinolinolate fungicide, Du Pont Mildew-Resistant Enamel is especially suitable for meat-packing plants, poultry and cheese plants, creameries and other areas where mildew presents a major problem. Tests prove that in most types of food processing plants it effectively retards mildew formation for months . . . eliminates the need for constant cleaning and scrubbing. And Du Pont Mildew-Resistant Enamel resists chipping and cracking . . . stays bright-looking month after month. What's more, when you consider the expense of constant cleaning, you'll realize just how economical this superior maintenance finish is. Mail the coupon today for complete information.



Photograph shows section of beamed ceiling in food-processing plant after three years' exposure. Lower strip: cleaned but left unpainted. Upper left: painted with ordinary non-fungicide enamel. Upper right: painted with Du Pont Mildew-Resistant Enamel.

Check these important advantages:

- √ **Effectively retards most types of mildew**
- √ **Cuts maintenance costs**
- √ **Odorless during application**

FREE LITERATURE! Mail coupon today.

E. I. du Pont de Nemours & Co. (Inc.)
Finishes Division, Dept. FF-65
Wilmington 98, Delaware

Gentlemen:
Please send me, without obligation, free literature on how to combat mildew.

Name_____

Address_____

City_____ State_____

DU PONT

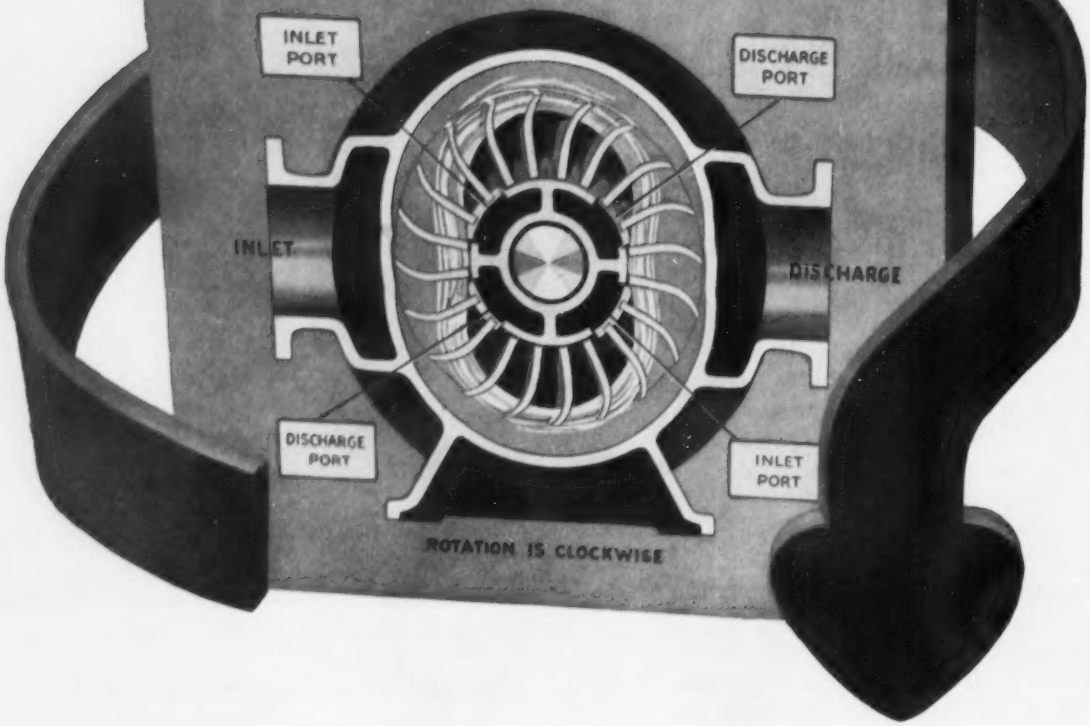
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

PAINTS

Chemically engineered to do the job better

For more data, circle this page number on card at back →

Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters



Here is Why!

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

No oil filters.
No dust filters.
No internal lubrication to contaminate air handled.
No internal wearing parts.
No valves, pistons, or vanes.
Non-pulsating pressure.
Original performance constant over a long pump life.
Low maintenance cost.

NASH ENGINEERING COMPANY
395 WILSON, SO. NORWALK, CONN.

Low-cost insulation for cold rooms handles easily, has excellent efficiency

You can keep cold room construction costs low with economical Armstrong Armaglas* AE Board. Light weight and easy to handle, AE Board is installed by standard hot asphalt or cold erection methods. This rigid glass fiber insulation has high thermal efficiency. A heavy coating of asphalt gives the board good moisture resistance. Being made of glass, Armaglas AE Board will not decay or rot and is completely sanitary. It comes in 6-lb. per cubic foot density, in 12″ x 36″ size, 1″, 1½″, 2″ 3″, and 4″ thick.

Armaglas AE Board is one of the quality products in the complete line of Armstrong Industrial Insulations. Armstrong also offers you a complete contracting service, geared to install these products economically and efficiently.

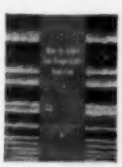
Send for free booklet on Armstrong Armaglas or for information on other materials that can help you solve your insulation problems.

* Trade-Mark. Manufactured for Armstrong by Owens-Corning Fiberglas Corp.

Armstrong

INDUSTRIAL INSULATIONS

☐ Armstrong Armaglas Insulations for Low-Temperature Rooms



☐ How to Select Low-Temperature Insulation

☐ Armstrong Insulcolor®, Weatherproof Coating in Seven Colors

☐ Armstrong LT Cork Covering, a New Type Cold Line Insulation

Armstrong Cork Company
2005 Seventh St.
Lancaster, Penna.

Please send me the free booklets checked. ☐

Please have an Armstrong representative call. ☐

Name .....

Position .....

Company .....

Address .....

City ..... Zone .... State .....

For more data, circle this page number on card at back →

SOLUBLIZED SPICE FLAVORS...

Symphony IN SEASONINGS!

Among spice flavors, Griffith's *Solublized* Seasonings have the rich, full-flavor quality of the Symphony. The mellow, balanced harmony that can win more patronage for your product!

Griffith—*both composer and master artist*—renders a customer's "*flavor score*" with such fidelity, even critics applaud. Blending the woodwinds, violins, horns and 'cellos *of the spice realm* into a more harmonious sensation of flavor tones so pleasing to your particular patronage.

Connoisseurs of flavors, practiced in the science of spice blending for over 30 years—Griffith artistry will give your product a new high in taste appeal. Try Pepperoyal, or a special blend of *Solublized* Seasonings—now.

For all pork curing—sausage, hams, bacon, picnics—use Prague Powder to accelerate full bloom of flavor and lasting color. U. S. Patent Nos. 2054623, 2054624, 2054625 and 2054626.

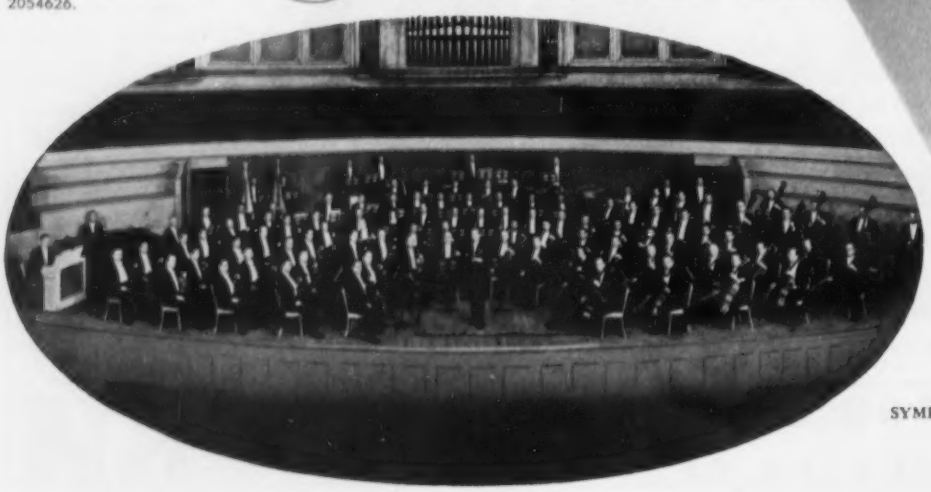
The

GRIFFITH

LABORATORIES, Inc.

In Canada—The Griffith Laboratories, Ltd.

CHICAGO 9, 1415 W. 37th St. • NEWARK 5, 37 Empire St.
LOS ANGELES 58, 4900 Gifford Ave. • TORONTO 2, 115 George St.



CHICAGO SYMPHONY ORCHESTRA

PEPPEROYAL
is a registered name

For HEATING, VENTILATING and AIR CONDITIONING

NEW...

WESTINGHOUSE AIR HANDLING COMBINATION UNITS in 13 basic sizes give you Unlimited Selection...

The most complete line for every job—Westinghouse Air Handling Combination Units handle from 500 to 48,500 CFM.

These versatile units, each with a choice of two coil face areas; in five coil types (see panel at right) and accessories as required, permit you to select from the broadest line in the industry.

Only Westinghouse Gives You:

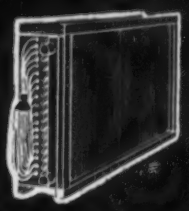
- High Efficiency
- Quiet Operation
- Non-Pulsating Air Flow
- Corrosion-Resistant Construction
- High Capacity—Low Resistance Coils
- Single Equipment Warranty

For complete application service, call your Consulting Engineer or your nearest Sturtevant Division Sales Engineer . . . or write Westinghouse Electric Corporation, Sturtevant Division, Department 6E, Hyde Park, Boston 36, Mass.

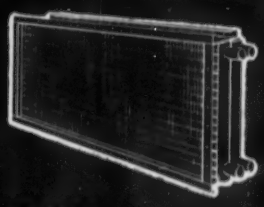
WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE...IF IT'S Westinghouse

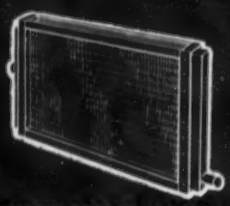
J-80691



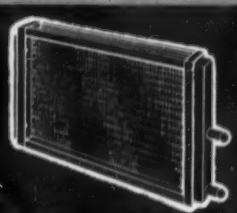
DIRECT EXPANSION FOR COOLING AND DEHUMIDIFYING . . . 3-4-5 and 6 rows deep.



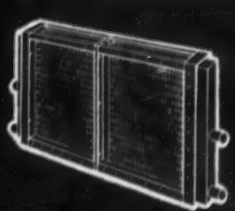
WATER COILS . . . for heating, cooling and dehumidifying—2 through 8 rows deep.



STANDARD STEAM HEATING COILS . . . for use with modulating damper control—1 and 2 rows deep with 3 fin spacings.

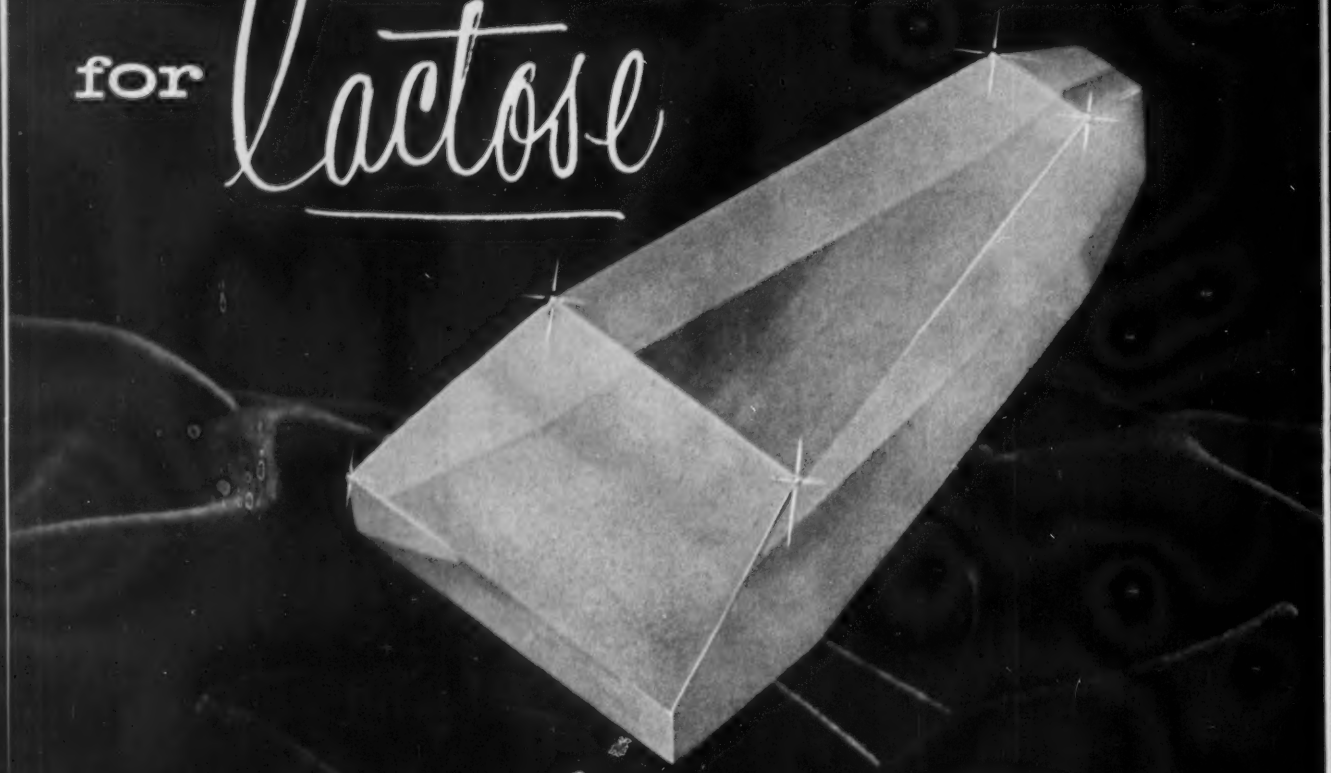


STEAM DISTRIBUTING TUBE COILS . . . for use with modulating steam valve control—1 and 2 rows deep with 3 fin spacings.



DUAL FEED STEAM DISTRIBUTING TUBE COILS . . . available in fin tube lengths—78 through 120 in.—1 and 2 rows deep with 3 fin spacings. Operates as two coils in single casing—supply and condensate connections at each end—eliminates stratification.

Does the new price picture for *lactose*



put a *Sparkle* in your eye?

from laboratory to production . . . milk sugar is finding hundreds of new uses

• There's a new look for lactose — a new competitive price tag that's a challenging invitation for re-evaluating this versatile sugar. That's why many firms, seeking a better product, are re-analyzing processes . . . using lactose for present ingredients (other sugars, etc.) and developing new uses for it. If you represent one of these forward-looking firms . . . or are interested in the possibilities of lactose . . . consult Western Condensing, America's largest supplier of high-quality milk derivatives.

Rigid laboratory testing and quality control in manufacture make Western's milk sugar a product you can depend upon. With Western's lactose, you'll be assured of top-quality, high-purity materials that meet or exceed accepted standards. Available grades: U. S. P., edible or crude, in a variety of screen sizes on regular or special order.

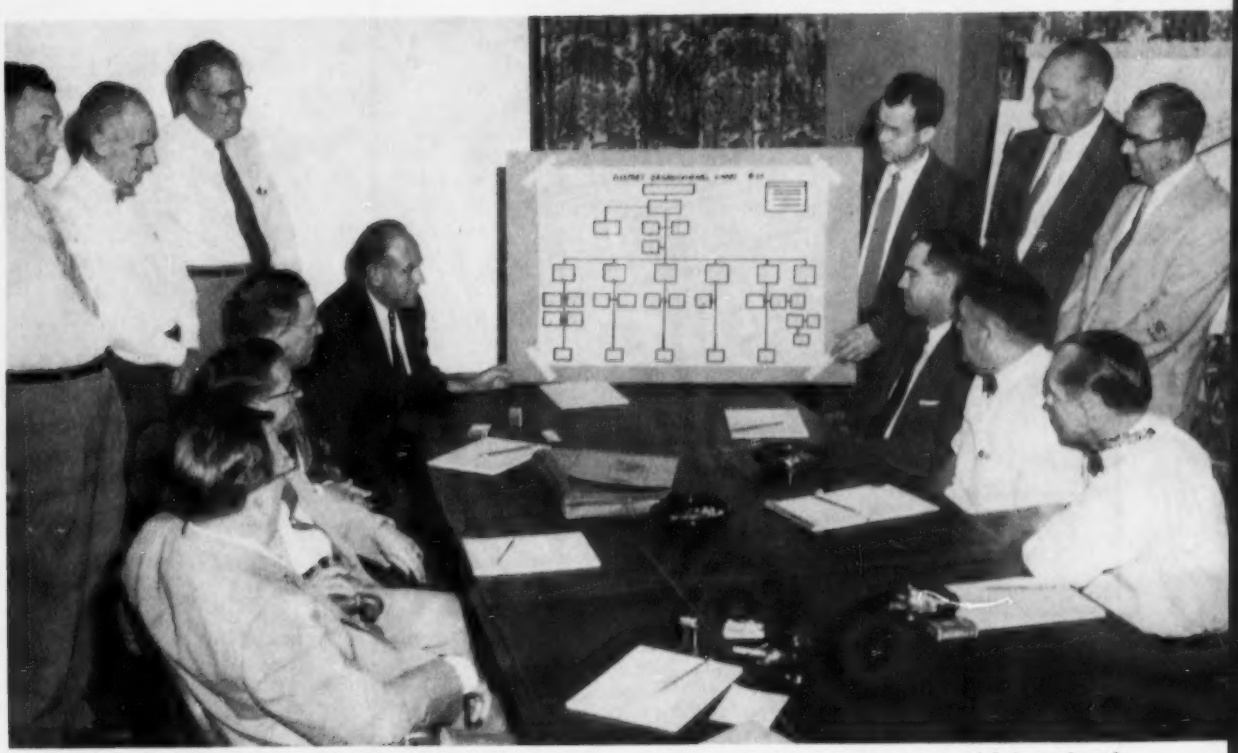
For detailed specifications, samples and price, write Western Condensing Company today, at Appleton, Wisconsin. Prompt delivery regularly assured from conveniently located shipping points, coast to coast.

FOREMOST lactose

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

A WORLD-WIDE SUPPLIER OF HIGH-QUALITY MILK DERIVATIVES



DISTRICT ORGANIZATIONAL CHART, which shows management structure, both present and potential, is reviewed and approved at home office meeting of district managers, central office department heads and officers of company.

Omar's Top Brass

Gets Down to 'Pay-Off Basics' In Merit Rating

Thorough In-Depth System Raises Caliber of Advancements . . . Sparks Pertinent Training . . . Insures Good Men Coming Up on All Levels

IVAN C. MILLER
Associate Editor, "Food Engineering"

The 450 to 500 supervisory employees of the many bakery operations conducted by Omar, Inc., headquartered in Omaha, Neb., know that their strength and weaknesses, their efforts and progress, are constantly under observation from above.

They recognize, too, that this involves more than mere checks by their immediate bosses. Actually, their complete records are investigated and reviewed once a year all the way up the line through department heads to top company officers.

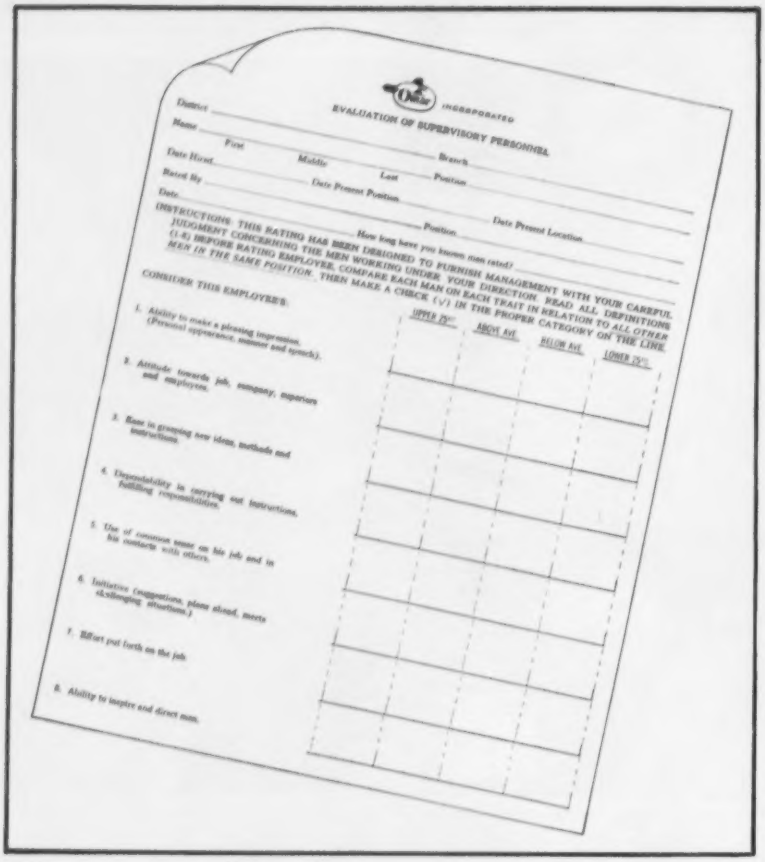
What's more, they're well aware that group training—and, in addition, special instruction to compensate for individual short-comings or weaknesses —is provided to prepare them for advancement.

In short, as each one's improvement and ability justifies, he moves directly into line for a specific job advancement—and on a "ready in x time" basis.

Pin-Pointing the Plan

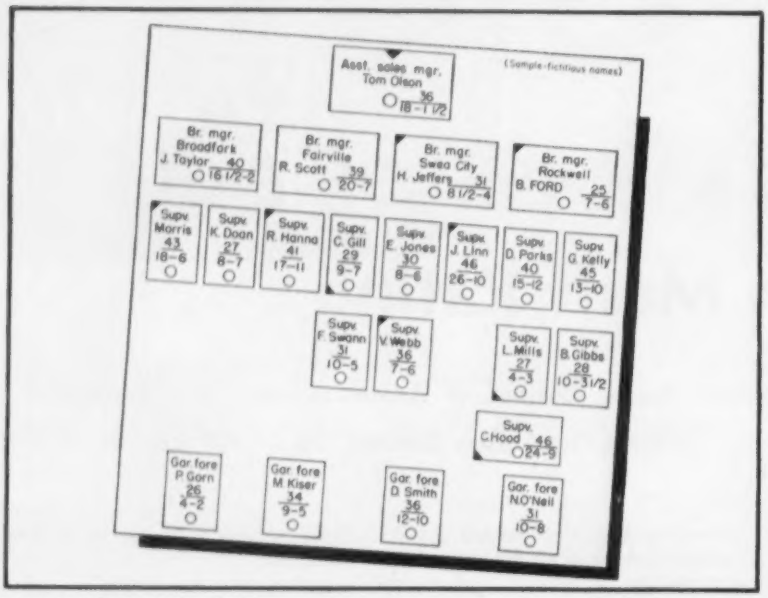
Far more intensive and extensive than most, Omar's meticulous system of merit rating is, of course, costly in top-executive time and effort. But it pays off with many valuable dividends.

Here are details of this executive training program, and a review of the rewards that have been reaped:



EVALUATION OF SUPERVISORY PERSONNEL

RATING FORM. On reverse side of sheet are recorded employee's personal characteristics, strengths, weaknesses, counciling and training needs, performance rating, present rank, and recommendations for future status on stated time schedule.


(Sample-fictitious names)
Asst. sales mgr. Tom Oleon 36 18-1 1/2
Br. mgr. Broadfork J. Taylor 40 16 1/2-2
Br. mgr. Fairville R. Scott 39 20-7
Br. mgr. Swea City H. Jeffers 31 8 1/2-4
Br. mgr. Rockwell B. FORD 25 7-6
Supv. Morris 43 18-6
Supv. K. Doan 27 8-7
Supv. R. Hanna 41 17-11
Supv. C. Gill 29 9-7
Supv. E. Jones 30 8-6
Supv. J. Linn 46 26-10
Supv. D. Parks 40 15-12
Supv. G. Kelly 45 13-10
Supv. F. Swann 31 10-5
Supv. V. Webb 36 7-6
Supv. L. Mills 27 4-3
Supv. B. Gibbs 28 10-5 1/2
Supv. C. Hood 46 24-9
Gar. fore P. Garn 26 4-2
Gar. fore M. Kiser 34 9-5
Gar. fore D. Smith 36 12-10
Gar. fore N. O'Neil 31 10-8

COMPREHENSIVE RECORD of all management posted on organization chart.

Now in its second year, the program makes careful annual evaluation of every supervisory employee. This study is carried out by the supervisor's boss, with a representative of the personnel department "sitting in" for thorough review of the man's background before the actual evaluations are made.

The complete personal history and work and performance records of the supervisor are analyzed and discussed. The boss then fills out an evaluation form. In no way does the representative of the personnel department attempt to influence the rating. However, the "rater" must be able to back up each portion of his evaluation with solid facts and valid reasons.

Next step is a meeting of the rater, a representative of the personnel department, and the rater's own boss. Here, each point of evaluation is again thoroughly analyzed and discussed until agreement is reached.

And that's not all. In addition, considerable time is devoted to developing plans by which the supervisor being rated can be helped—both through counseling and by specific predetermined training during the next year.

Up the Scale

Subsequently, the district department head (say, a production manager) then presents all the ratings of all his supervisors to his district manager for further approval. In this meeting, also including a personnel department representative, there are extensive discussions of any points of any ratings that the district manager may question in his very exacting review.

If any changes are suggested in this meeting, they call in the boss who made the original evaluation of the supervisor in question. Then agreement must be reached before final approval by the district manager.

Concluding step relative to rating and training planning is an Omaha management meeting that gives exclusive emphasis to reviews and discussions of each district's ratings. Taking part here are the district managers, central office department heads, and officers of the company. Prepared in advance of these meetings are the evaluations for each district, summarized on large organizational charts. **• These charts show each supervisor's performance in color code—indicating whether he is outstanding, good, below standard, or unsatisfactory. Also "flagged" are all those who have developed potential for promotion to greater responsibilities in the company.**

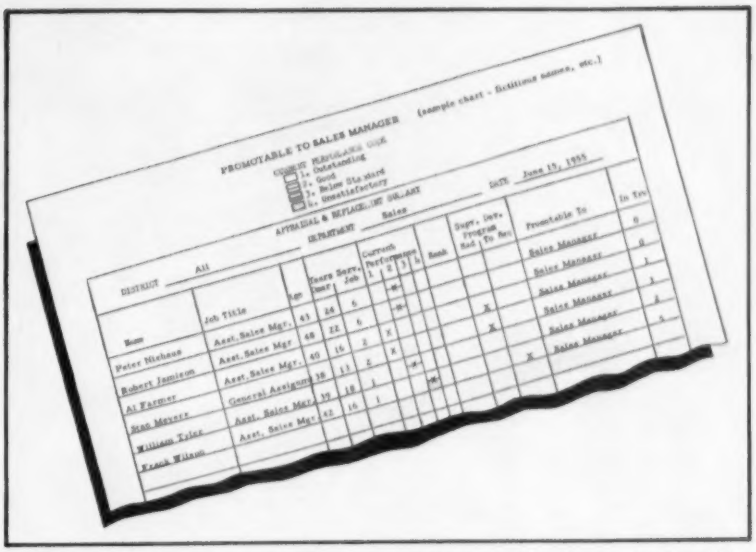
As each supervisor's chart is reviewed and discussed, the actual evaluation forms and also his complete personal history, photograph, work and performance records are available for examination by any one of the department heads, officers, or other district managers who may want such further "specifics."

Thus, through these careful steps,

all the various facts and viewpoints relative to all supervisory employees are precisely sifted and weighed—to attain common agreement by everyone in management as to their current performances and in regard to acceptable plans for their future.

• Nor does this program end at the basic supervisory level. Rather, it is to be noted that the Omar checks carry up to, and include, district managers and central office department heads.

True, many other food companies, and also concerns of other industries, have evaluating merit-rating systems. However, Omar has pioneered this all-embracing program wherein every level of management devotes the required time and energy. This means not only selecting and charting of potential executives as replacements and to fit expansion plans, but also scheduling of training in line with what the individual needs to move ahead.



DISTRICT CHART reveals where present management is strong or vulnerable and also available replacements for the next 5 years.

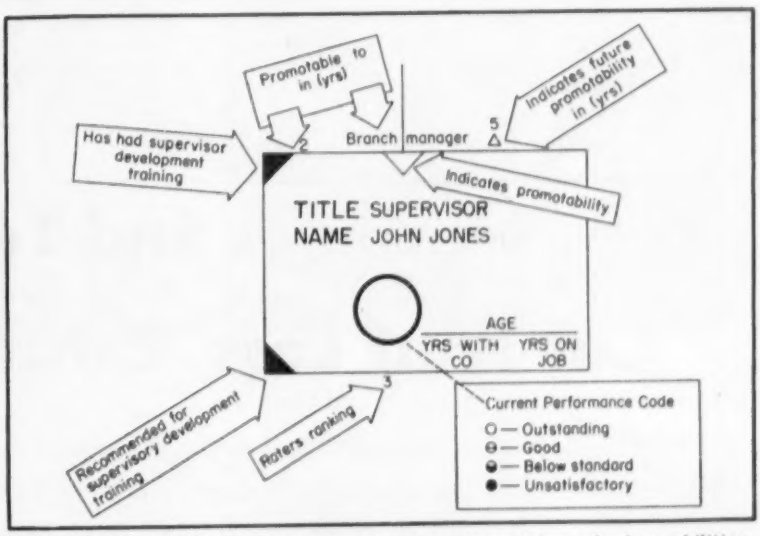
How Records are Kept and Used

The evaluation form (reproduced here in condensed version) is self-explanatory. It not only provides a rating of the individual, but also a *comparative record* of all supervisors under each evaluator or boss.

From these individual ratings are prepared complete organizational charts for each district, and in turn for the company as a whole. On these charts are shown each individual's title, name, age, years with the company, years on the job, and whether he's had the development training. If he hasn't, the chart indicates whether or not he is now being recommended for it.

Current performance is depicted by a color code within a circle immediately below the individual's name. In addition, there's an inverted triangle to tell whether or not this man is recommended for promotion, and if so, the job to which he is "promotable."

Revealed also is the "timing" relative to advancement—that is, in how many years can the necessary training to the *ability to perform* be absorbed and applied by the man.



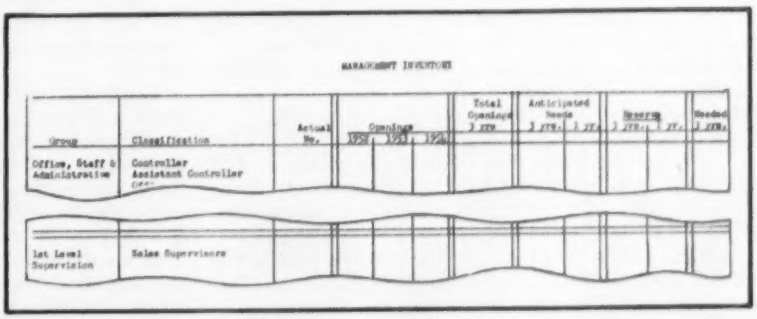
RECORDS OF PROMOTABLES keep top executives informed of capabilities and training needs of all first and second line management.

Yearly Inventory of Needs

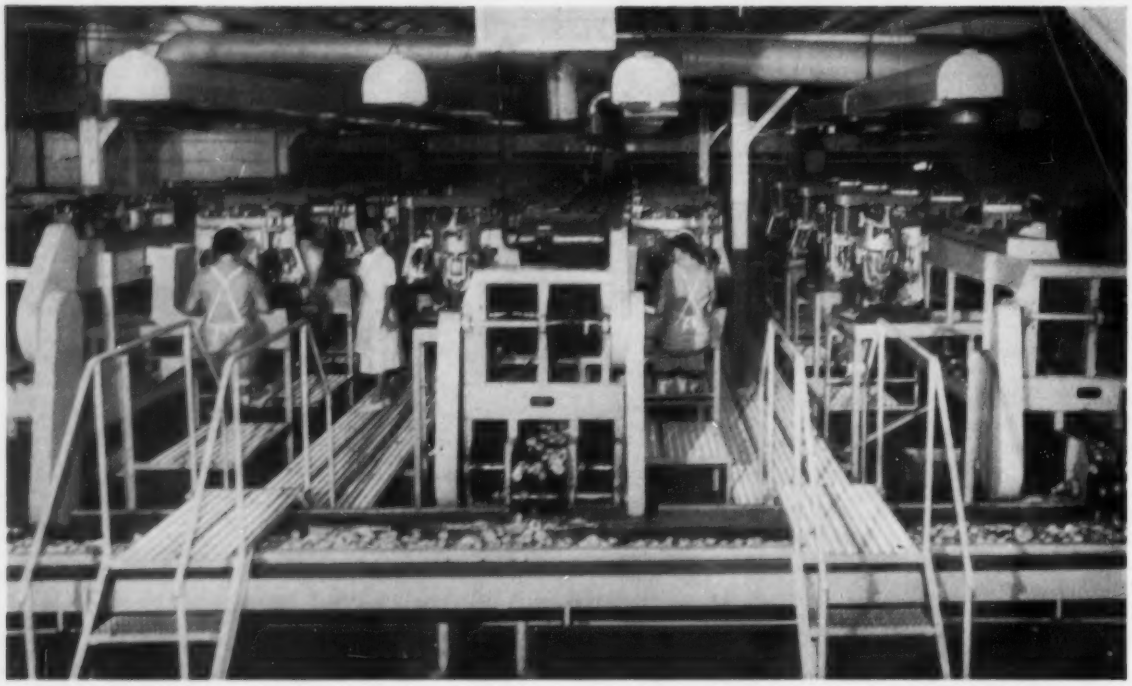
Prepared each year is an inventory of executive personnel requirements—a list of actual openings in all management classifications over a three-year period. From this is computed turnover from each classification, and then anticipated needs in terms of management personnel, both for the next year and for the next three years.

Against this is tabulated the reserve

(*Turn to page* 194)



INVENTORY OF MANAGEMENT summarizes entire company's net worth in management personnel and forecasts or future leadership assets.



56 PITTERS are arranged in rows of seven on each side of four conveyor systems. Upper belts feed peaches to operators. Pitted fruit falls on small outer conveyors below, where they're inspected before being shunted to center one which discharges to main, transverse conveyor. Expanded-metal platforms and aisles provide worker comfort and improve sanitation. And fluorescent lighting and cool air from overhead ducts up worker efficiency.

New Machines and Techniques Cut Fruit Loss, Raise Quality

Units pit clingstone peaches by twisting, thus save more of highly flavored inner flesh . . . And improved alkali peeling removes less fruit, guards color

C. R. HAVIGHORST

Senior Associate Editor, "Food Engineering," San Francisco

Two important developments in the peach processing line at Thornton Canning Co., Thornton, Calif., are:

- **Installation of 56 new and revolutionary pitters for cling peaches.**
- **Introduction of a new technique in peach peeling.**

Heretofore, pits of cling peaches were mechanically cut or "spooned" from the fruit. This required size grading and routing to specific pitters that had their cutting knives set to handle the particular sizes with a minimum of waste due to adhesion to the pit.

Amount of waste was dependent on accuracy with which the cutting knives were adjusted. It could range from small to as high as 11%.

The pitters, manufactured by Filper Corp., Richmond, Calif., do not necessarily require size grading of fruit. They first halve the peach at the suture, then twist the halves apart causing the pit to fall free.

Optimum efficiency rate of an operator is 48 peaches per minute. This is not the rated capacity of the machine, however, for some records show speeds of 60 or more per minute.

Feed hoppers of the machines are comfortably close to each operator. She has only to select a peach from the hopper and position its suture properly, then place the fruit in the feed cup of the pitter. A constantly full hopper is assured by use of ⅛-in.-dia. wire stretched obliquely across the feed belt as a diversion sweep. When a hopper is full, peaches are blocked from entering it and merely overflow the sweep and continue to the next hopper.

There are three discharge conveyors—two small and one large. Pitted fruit drops onto the small belts, which are on each side of the main conveyor. Behind each pitter is an area where halves on the small belts may be inspected

for pitting efficiency before they are swept off onto the main conveyor.

Pitting failures are infrequent unless split pits occur. Halves with pits, or half-pits, are separated from the main flow at a sorting belt following the pit-shaker. Such fruit is conveyed to the re-pitting line, where the remaining pit is spooned out. This line is separate from the one served by the Filpers, and the peaches pitted on it are canned and marketed separately.

In this field, an average yield, or recovery, of peaches using conventional pitters is about 47-48 cases (basis 2½'s) of canned peaches per raw ton. The new unit increases this recovery, but accurate data is not yet available.

Quality Analysis

Studies made by the U. of Calif. (Davis) indicate that quality improvements with the new pitters are largely in appearance and flavor.

Appearance refers to conformation and color of the peach halves. Flavor is improved, since the flesh close to the pit—the portion having the highest concentration of organic acids—is not removed. As a result, the sugar-acid ratio is improved.

The pit of a clingstone peach grows to its flesh exactly as its varietal name implies. It actually is an integral part of the flesh, adhering firmly and closely. And this inner

FOR A GRAPHIC PRESENTATION of Thornton's outstanding peach-processing line, see this month's foldout flowsheet on p. 104-107.

flesh has a greater tensile strength than the remainder. It tends to return the half to its natural conformation, following peeling. There are, too, some good color aspects of this pit cavity not found in other parts of the peach.

New Peeling Technique

Conventional method of peeling peaches has been to submerge fruit in a 1%, 190-deg.-F., caustic solution. This has resulted in product losses from "over-peel" and, often, an unnecessarily deep penetration of the caustic.

Losses by this method have averaged 11-12% and as high as 16%. Under ideal conditions they were held to 4-5%. This procedure also adversely affected the anthrocyanin pigments.

The new technique, which requires only 60 sec. time, was originally developed for peeling freestone peaches. This season, it was adapted, with some modifications, to peeling clingstones (by Sherman Leonard, U. of Calif. Davis, in cooperation with Food Machinery Corp.).

First, caustic solution is pumped to a number of troughs located above a stainless mesh belt on which unskinned peach halves are conveyed "cup"-down.

Troughs are constructed with one low side over which a continuous film of caustic pours. It falls onto the fruit, but does not contact the peach flesh. Solution drains through the belt to be recycled.

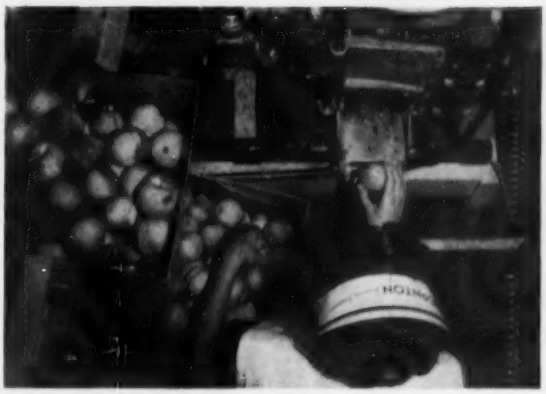
Peaches then go to the peeler's holding section, where they move forward in an atmosphere of steam. In the final section, skins are washed from the fruit under 50-60-psi. water sprays, which also remove residual caustic.

In this washing section, fan-shaped sprays are used, and these are positioned differently than in conventional peelers. This change has resulted in more effective peeling, with water savings as high as 80%.

Since temperature, as well as strength, is critical, the caustic solution is recycled through a heat exchanger. Regular checks are made for strength and solids content

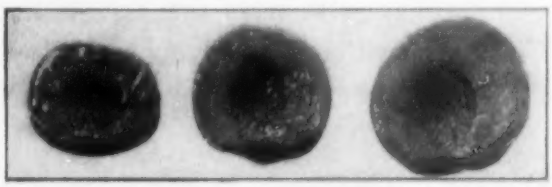
(*Turn to page 100*)

How New Way Does It



GIRL removes peach from hopper and places it in feed cup, which swings through protective rubber curtain and impales it between cutting knives. Then . . .

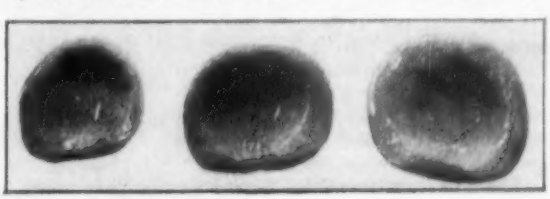
. . . **BLADES** cut fruit, and rubber fingers close in to twist halves in opposite directions as pit is held stationary. Fruit and pit drop to conveyor.



RESULT: Improved appearance and a greatly augmented recovery of fruit.

In Contrast

Fruit pitted by conventional methods shows excessive removal of good flesh and is much less colorful



Masterbrewer's taste committee gets extra assist from . . .

THIS COMMITTEE daily checks Blatz beer on taste, aroma, bouquet, clarity, etc. Then SQC panels back up this masterbrewer's group by testing beer's uniformity. From left: P. A. Schamber, masterbrewer; D. G. Ruff, superintendent of production; E. De Laet, S. Hasek, and M. Mader, assistant masterbrewers; and A. Boyer, chief chemist.

Here's SQC Technique for

Upping a Food's Taste-Uniformity

Blatz reinforces the taste-testing of its traditional masterbrewer's committee by applying specialized statistical sampling. Result is more "eagle-eyed" control over beer taste, also improvements in quality

EVERETT P. HOKANSON

Statistical Quality Control Supervisor, Blatz Brewing Co., Milwaukee

Uniformity in Blatz beer flavor is now being pinpoint-controlled. This is achieved through an SQC program borrowed—with modifications—from Schenley Distillers, a subsidiary of Blatz' parent firm, Schenley Industries.

The program is concerned only with precise control of beer-taste uniformity, through judging of finished product before packaging. It has, however, indirectly helped to improve beer quality—for it has specifically alerted production men to inadvertent variations affecting quality as well as uniformity.

Also, it's given basic training to many nonexpert tasters, who now can be called on when production experts initiate specialized taste-test projects.

The brewery adopted this "added taste-uniformity insurance" with the consumer in mind. As we put it, customers select the beer "for a certain skillfully brewed-in Blatz flavor—right amount of body, aroma, and other taste characteristics." And they expect to find this bottle-to-bottle.

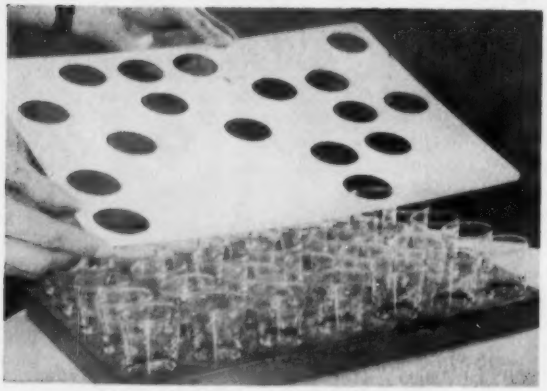
Supplements Committee

So now, statistical principles *supplement* the taste-testing of our beer at various stages of processing by several experts making up the traditional masterbrewer's taste committee.

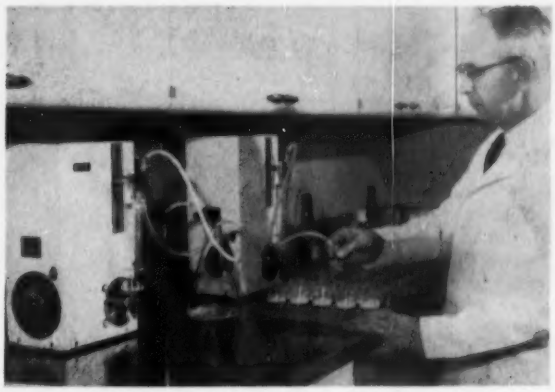
This new technique double-checks against possible taste fatigue by these experts—masterbrewer and aides, production superintendent, and chief chemist.

The aim is reduction of this committee's "guess" errors, which, of course, can crop up no matter how

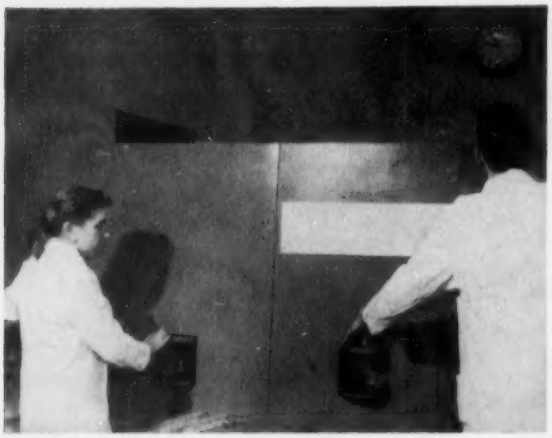
. . . statistical QC lab's very carefully selected panel tasters



1 **BLATZ SCIENTIFICALLY "RANDOMIZES"** samples for panelists by laying vari-pattern coded templates over shot glasses and pouring standard (control) beer through the holes (see next page for detailed drawing of template system). Then template is removed and . . .



2 **. . . REMAINING GLASSES** are filled with the production beer that is to be tested for uniformity. All samples are precisely meted out by automatic pipetting machine, here demonstrated by Author Hokanson. Each 2-oz. glass gets 8 ml. of uniform-temperature beer.



3 **VIA TURNTABLE OPENINGS** in partition, SQC staffers pass samples through to panelists in booths on other side. Glasses are lined up less than 2 min. in advance of tests. Note how staffer (right) is closely timing serving sequence by watching second-hand of clock.

4 **PANEL MEMBERS** take samples in individual testing booths. They rinse mouths with distilled water before each test series, and beer is not swallowed. There's no conversation. And "note comparing" is eliminated, since templates have varied samples for each tester.

expert members may be. And SQC lab is now top management-instructed to reject any tanks slated for packaging that show significant taste difference, and also to report to the masterbrewer any tanks with lesser indication of non-uniformity.

Thus, the whole project is conducted in close-working cooperation with masterbrewer's committee.

Indicative of production excellence in overall quality and uniformity is the fact that an average of 93% of tanks clear SQC taste-testers at the first crack. Only 2-3% are isolated outright for mandatory reprocessing. Remainder are called to masterbrewer's attention, who determines if corrective action is needed.

Daily, the masterbrewer's taste committee tests beers drawn from production, storage, and finishing cellars, as well as bottling lines (after pasteurization). Its tasks include much more than looking for taste uniformity alone. For *right quality* must also be brewed in. The committee also looks for the many inherent processing variables, which might affect quality in spite of the constant chemical analyses (106,000 in '55), rigid formula adherence, etc.

This group daily samples anywhere from 35 to 60 beers, depending on production. It's quite a chore, and makes taste fatigue a critical factor.

Time is a limiting factor, too. Committee members have other production duties crowding the 40 to 65 min. daily devoted to sampling. Also limited are the number of committee members (6 total for all tanks, compared with at least 10 and often 15 different SQC panelists tasting each tank).

Comments on taste characteristics—like "yeasty," "malty," "beery," "winey," "sweet," "hoppy," etc.—are recorded by a chemist. These serve as one basis for instructions to act on a tank before clearing it for the next operation.

The masterbrewers committee samples beer from finishing tanks a week before the scheduled packaging in bottles, cans, or kegs. Final check for taste uniformity is provided by the SQC lab just two days prior to packaging.

Testing in this manner gives the committee enough time to take corrective action if needed. A non-uniform tank is blended, or otherwise reprocessed, before the beer is polished-filtered prior to bottling.

As stated, the chief concern of the new SQC, or

psychometric, lab lies in objective quality-control checking of the beer's taste uniformity. This can't be done by chemical tests. Nor is subjective, day-to-day variable judgments of the masterbrewer's committee the complete answer. Here, Blatz went beyond already extensive quality control measures and modern brewing methods and came up with SQC tasting.

Major Initial Problems

Some of the major starting problems were how to: (1) Select standard samples, (2) compare them with production beer, and (3) determine the significance of the ratio of "right" and "wrong" responses by taste-testers when attempting the correct matching of two of three unidentified samples.

The SQC lab, centrally located in the bottle-house, has five partitioned taste booths, separate from working area. With private door entrance, neutral taste-test conditions, are assured.

About the Panels

Each of six panels are made up of five screened-out plant employees. Panelists filed into the SQC lab twice each morning at specified times. Each is served 4 tests at a sitting—making a total of 20 tests for a panel. Samples from production tanks are compared against the standard.

A 1-hr. rest for each panel before testing the next lot of samples checks taste-fatigue.

Trays of 2-oz. shot glasses are set up about 3 min. preceding each test, with each glass containing exactly 8 ml. of either production beer from finishing cellar tank or the standard beer. Portions are dispensed at uniform temperature by automatic pipetting machines. Beer samples are served from a service counter on the opposite side of booths, through individual turntables.

Random sequence of serving samples is achieved through use of coded plastic templates (see photo and figure). Glasses under template openings are filled first with the standard sample; remainder get production beer under test. This "randomizing" of sample servings eliminates "note comparing" by panelists. Warm-up samples and mouth-rinses with distilled water between tests condition panelists' mouths.

The following typical serving to one panelist will demonstrate the duo-trio pattern (two tests per tank, three sample glasses for each test), with serving time included:

Warm-up . . . 20-sec. interval . . . standard beer . . . 10 sec . . . production beer . . . 10 sec. . . . standard (completes first test) . . . 20 sec. interval . . . production beer . . . 10 sec. . . . production beer . . . 10 sec. . . . standard (completes second test). Total time—80 sec.

First sample after warm-up is announced to panelists as "control sample." Next two are announced as "Sample No. 1" and "Sample No. 2." Same order is repeated for second test. Object is to match correctly, in each test, either No. 1 or No. 2 with control sample.

In the typical serving indicated in accompanying schematic of template serving, Panelist 1, if correct, would have written down "1" for the first test and "1" for the second, or simply a response of "1-1."

Each panel makes a total of 10 tests per tank. At least two panels (20 tests) are required to approve a tank.

Tests on a second tank follow the first series of two tests, establishing a quadro-trio pattern for each panel (4 tests, 3-glasses each, per panelist) and thereby supplying test data on two tanks.

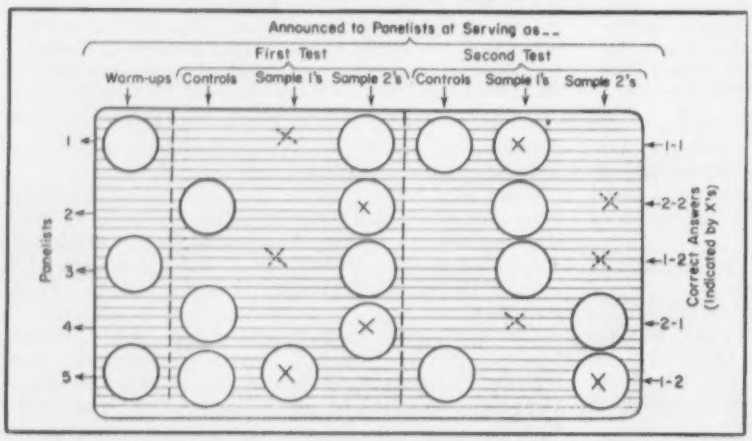
About the Scoring

When the scores from two panels taste-testing one tank indicate non-uniform flavor, further testing is called for.

And now, here is how the SQC scoring is applied: First off, there was recognition that by chance alone a panelist may correctly match two of the three samples half of the time—no matter how close taste-wise. Hence, the lab chose a uniformity mean of 50% correct answers.

(Turn to page 147)

Schematic of Sample-Filling Template Illustrates How System Works



ONE OF EIGHT different templates. Circles represent holes through which standard (control) beer is filled into glasses on tray. This template blanks out 17 glasses, which then get production (test) beer. As indicated on left border, rows of glasses are served to individual panelists, who then decide, in each of the two tests, which of two samples matches the control. Correct answers for both tests are shown on right border and are also indicated by X's. Of course, each X'd circle always matches to a control circle (both standard beer). And each dotted-X sample, in glass under blank area, naturally pairs with a control glass blanked out by template (both production beer).

Scoring Pattern For Taste Uniformity

Scores	Interpretation
	1 PANEL (10 TESTS)
0-to-10 to 3-to-7	Invalid: Discard as negative response and submit to next panel.
4-to-6 to 7-to-3	Valid uniformity score for one panel. Only one 4-to-6 score accepted per tank.
8-to-2 to 10-to-0	Valid: Indicates probability of significant non-uniformity.
	2 PANELS (20 TESTS)
9-to-11 to 14-to-6	Tank cleared. (Score of 9 to 11 is lowest combination of two valid panel scores.)
15-to-5 to 20-to-0	Must go to 3rd panel, due to two significantly high panel scores.
	3 PANELS (30 TESTS)
19-to-11 to 20-to-10	Tank cleared. (3rd panel scored either first 4-to-6 or 5-to-5.)
21-to-9 to 22-to-8	Calls for 30 retests. Tanks reported to masterbrewer if similar scores prevail.
23-to-7 to 30-to-0	Basis for rejection. Calls for 30 retests to minimize possibility of chance scores. Tank rejected if high scores prevail.

IRRADIATION AND ANTIBIOTICS

May Team Up to Preserve Meat

AMI researchers also explore: ¶ New convenience through dehydration. ¶ NMR food-gaging, process control. ¶ Better cake volume using rearranged lard. ¶ Product improvers

FE STAFF

How to get more shelf-life into meats was a leading theme at the recent 8th Research Conference, sponsored at Chicago by the Council of Research of the American Meat Institute.

Following are briefs of the papers:

Cites the Latest Progress With Radiation, Antibiotics

Rapid growth of prepackaging of fresh meats points up the need for more effective methods in prolonging keeping quality, according to C. F. Niven, Jr., American Meat Institute Foundation.

Life of fresh meats held at near freezing temperatures is limited by the fast development of low temperature-growing surface contaminants (pseudomonads). Effective methods of killing or checking the growth of these bacteria would hold promise in prolonging the refrigerated life of fresh meats.

Low levels of gamma radiation will kill these pseudomonads in the prepackaged meat, thus resulting in a significant extension of their shelf-life with respect to bacterial spoilage.

Antibiotics, especially the tetracyclines, are exciting interest as effective and harmless preservatives for certain foods. Preliminary studies on fresh meats have demonstrated that safe levels of these substances effect a moderate increase in shelf-life.

Because of the possible complementary effect of gamma radiation and antibiotics on flora normally found on meats, a combination of these two preservative methods is being investigated. And results thus far show reasonable promise.

However, there must still be extensive evaluation, especially with regard to non-bacterial effects, such as loss of color and excessive drip-loss as meats are held under simulated display conditions.

Ionizing radiation treatment (gamma rays) of beef muscle or beef-muscle extracts oxidizes (to green pigment) some of the myoglobin. This is of considerable interest, since this green pigment may be the same as that observed in certain discolorations of curing meat during storage.

Dehydration Is Winning Additional Convenience

Food items in dehydrated form enjoy widespread consumer acceptance due to the convenience, stated E. W. Turner, QMC Food & Container Institute for the Armed Forces.

Thus, the future of dehydrated meats and seafoods for home use look very encouraging, based on consumer preference ratings obtained for dehydrated meat products developed at the QM Institute.

The dehydrated meat and meat-food products are ideal for Armed Forces' feeding, particularly for operational rations, which must be simplified to meet the new logistical requirements of modern warfare.

▶Freeze-dehydrated meat is termed much superior to meat dried by other means. Undesirable flavor and texture changes are avoided and freeze-dehydrated meat has better storage stability than air- or vacuum-dried meat.

High quality of freeze-dehydrated meat is attributed to the low temperature and high vacuum, which permit sublimation of ice from frozen product. This minimizes case hardening and makes it possible to achieve a final moisture content of less than 2% (increasing product stability). Freeze-dehydrated meat must be packaged in an oxygen-and-moisture impermeable container to prevent storage deterioration.

Texture and flavor of freeze-dehydrated meat are improved by the addition of certain inorganic ions to the water used for rehydration.

Freeze-dehydrated raw meats ready for army-user tests include rib steaks, sirloin steaks and pork chops, as well as codfish sticks. Pre-cooled products that can be prepared for serving simply by adding hot water are: Chicken and rice, chicken stew, frankfurters and beans, and chili with beans.

NMR Gages Food Moisture And Aids Process Control

Nuclear magnetic resonance (NMR) has proved to be a rapid, non-destructive instrumental method for measurement of moisture over a range of from a few to 100%, declared Thomas M. Shaw, Southwest Research Institute.

The method represents a specialized application of the techniques of the new field of NMR spectroscopy for quantitative analysis.

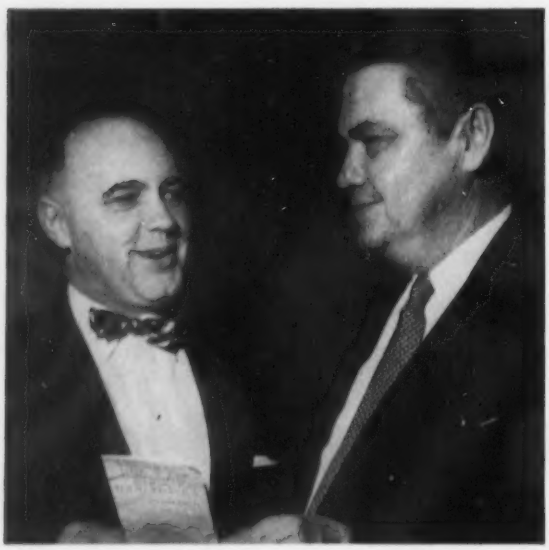
Here, the technique is based on measurement of magnetic properties of hydrogen nuclei and, as applied to measurement of moisture, takes advantage of differences in magnetic environment of hydrogen atoms in water relative to hydrogen atoms in solids, such as carbohydrates and proteins.

It has been successfully applied to measurement of moisture in a wide variety of hygroscopic materials like

(Turn to page 178)

Physicists "Put Finger" On Promising Food Techniques

—and find many potential applications in the areas of quality control, production, packaging, and distribution



HEADS of sponsoring organizations, L. E. Clifcorn, Institute of Food Technologists (left), and H. Vagborg, Southwestern Research Institute, talk over highpoints of the program.

JAMES A. LEE
Southwestern Editor, "Chemical Engineering"

Highlighting the recent Food Physics Symposium in San Antonio, sponsored jointly by Southwest Research Institute and the Institute of Food Technologists, were pertinent discussions on many applications of physical sciences to the food industry.

Tackling Current Problems

Considering the 40 fields of physics and their importance in the food field, P. M. Erlandson, Continental Can Co., Chicago, suggested a number of solutions to current problems:

Physicists and engineers, he said, can now develop miniature electrical and electronic networks which simulate both the steady-state and the dynamic or transient behavior of pumps, compressors, heat exchangers, storage tanks, valves, piping and other components of process plant equipment. Analogs of this sort can be directly used in plant design.

In mechanical measurements, one of the most needed contributions might be a really subminiature recording accelerometer which is extremely inexpensive. This could provide even a crude record of the shocks and impacts to which a packaged item is subjected.

Reducing Noises

The science of acoustics can well be applied in many of the food industry's plants and offices to reduce noise. There is increasing recognition of the very real way in which noise can lower productivity. In the automatic plant of the future, a high percentage of all employees will be skilled technicians who will find it necessary to concentrate on the job of operating the expensive units.

Sources of unusual illumination can be most useful in food inspection. For example, crab shells fluoresce under ultraviolet light, while the crab meat does not. Consequently, sorting is made easy. Many organic substances do fluoresce, and these properties may be useful for microanalytical work with food industry materials.

A new instrument—a fluorescence photometer which compares fluorescence in an unknown and a standard sample—has detected uranium in amounts of less than 10^{-10}g., and may be adapted for other materials.

One interesting technique recently applied to chocolates is radiation cooling, where the surroundings are made cooler than the outside of a body, and the body loses heat in accordance with physical laws based on radiation from a so-called "black body."

Scanning Techniques

Industrial use of the "scanning" principle of television, where a tiny spot of light is made to scan a given area in a systematic manner, will be of very major importance in years to come. Already, so-called "closed circuit" TV extends the range of human vision into uncomfortable or dangerous places.

But when the output of a TV camera is fed into the proper analyzing circuits, such as pulse length and height selectors and the like, a high speed motion picture can be dissected to pass only the significant information on to recording or control circuits.

In the food industry, this can bring about statistical appearance standards in color, size, and shape. Even today it would be possible to design a "correlation scanner" which would be able to inspect a line of sliced tomatoes or apples or raisin cookies, establish standards, and

actuate control devices, while keeping a temporary record of quality for as long as desired. Every detail of the visible characteristics of any food substance can even now be recorded on magnetic tape.

Analysis by Magnetic Resonance

The most recent method of spectroscopy to find its way into the industrial laboratory is radio frequency spectroscopy, according to T. W. Shaw, Southwest Research Institute.

This newcomer, which utilizes a portion of the electromagnetic spectrum not previously used for chemical analysis, already has several well-defined branches. These are: Microwave spectroscopy, electron paramagnetic resonance, and nuclear magnetic resonance. The last two are grouped together as magnetic resonance.

Experiments conducted over the past several years have amply demonstrated the feasibility of using nuclear magnetic resonance (n-m-r) for the determination of moisture in agricultural products in a rapid and non-destructive way. Simple moisture determinations may be made in a few minutes, and agree to within about 0.2% of the amount of water present in the 5 to 20% range.

Studies indicate that the method is essentially independent of particle size, and large differences in ash content do not appear to affect the result over the normal range of moisture found in commercial starches.

Test results suggest that n-m-r can be used to determine the moisture content of granular solids on a continuous flow basis. They also indicate some of the possibilities for the use of n-m-r in process control.

Importance of electron paramagnetic resonance spectroscopy (e-p-r) in the food industry stems from the fact that it can be used to investigate free radicals in biological material. Work with e-p-r has shown that stable free radicals are present in a surprisingly wide variety of material.

The experimental techniques and apparatus for detecting e-p-r signals are similar to those used in n-m-r. However, since the magnetic moment of the electron is about 660 times that of the proton, the electron resonance occurs at a frequency of a few thousand megacycles for the same magnetic-field strength that places the hydrogen nuclear magnetic resonance at a few megacycles.

The use of e-p-r for the detection of effects of radiation is particularly appropriate because of the present interest in the use of high energy radiation for food sterilization.

Vapor Phase Chromatography

Volatile organic substances in foods, although present in minute amounts, are of great importance, since they impart characteristic aromas and to a large extent determine quality.

These substances, and non-volatile materials which may be converted into volatile compounds by appropriate chemical means, may be analyzed by vapor-phase chromatography (vp-c), provided they can be isolated in a concentrated form.

This was the opinion expressed in a paper prepared by K. P. Dimick and J. Corse, Western Utilization Research Branch, USDA.

The method differs from liquid chromatography in that a gas is used as the eluant in place of a liquid. Two types of vp-c are recognized: Gas displacement chromatography, and gas-liquid partition chromatography.

In the former, a column is packed with dry absorbent, such as activated charcoal. A sample is placed on the column and blown through it by means of a gas stream. The gas stream may be saturated with a more strongly absorbed material, such as nitrobenzene. Separation occurs as a result of differences in adsorption energies.

In the latter method, the column is packed with a stationary phase of size-graded solid particles wet with a liquid of low vapor pressure. The substances are eluted from the column by means of a gas, separation occurring as a result of differences in vapor pressure over the liquid phase. This method is one initially developed for the separation of volatile acids and amines and is most applicable for the analysis of volatile flavors.

Bread, onions, cooked chicken, lemon and orange flavors are being investigated by means of vp-c. The bread flavors are concentrated from ovens and cooling rooms by charcoal adsorption on dry ice condensation.

Chicken flavor is collected from a broth in substantially the same manner as employed in the strawberry essence-recovery process. Lemon and orange flavors are obtained chiefly from cold pressed oils. Onion flavor may be collected either by steam distillation or charcoal adsorption.

Physics in the Meat Field

Recent developments in the meat field that are based on fundamental physical principles were enumerated by D. M. Doty, American Meat Institute Foundation, Chicago.

These developments are: (1) Injecto-curing techniques; (2) application of modern instruments for indicating and controlling temperatures, humidity, air velocity and smoke density in smoke houses; (3) electrostatic smoking; (4) high frequency heating for thermal processing of meat; (5) irradiation with beta and gamma rays for sterilization; (6) temperature measurement based on change of electrical resistance; and (7) use of physical measurements to evaluate meat quality.

▶ Possibility of utilizing an energy transformation rather than heat transfer to increase the temperature of meat products is very intriguing. Experimentation on this subject has been underway in the AMI laboratory for ten years.

When meat is placed between plates connected to a high frequency oscillator, the electrical energy is converted into kinetic particle energy, which is indicated by a temperature increase. Strictly speaking, this is neither induction heating (which depends upon electron motion), nor dielectric heating (which depends upon molecular motion). The process has been called "diathermal" or "thermotronic" heating.

The thermal energy of the meat is increased homogeneously for products such as ground pork luncheon meat. For non-homogeneous products, as the cured boned hams, certain supplementary techniques are required for completely uniform heating. Slight venting of the processing cell to provide agitation of the liquid contents by boiling has resulted in quite uniform temperature throughout the cell content.

Crystallization of Foods

Relatively simple physical methods of measuring crystallization in food products are available to food scientists, in the opinion of A. Cornwell Shuman, Purdue University. But they are not widely used.

One is the polarized light microscope. It can be applied to spray dried products, salt, dry mixes and chocolate.

Another method is X-ray diffraction, applicable to proteins, spray dried products, and polymorphs such as fat.

A third method is thermal analysis, feasible for frozen

foods and chocolate, and also as a general laboratory technique.

Operation of the polarized light microscope is based on the principle that polarized light moves through crystals with different spreads, depending upon the direction of vibration of the light. By observing color formation in polarized light as it passes through a material, we can find out much about the nature of the material:

1. We can learn if the material is crystalline by noting whether or not there is color formation. Thus we can tell that there is an orderly arrangement of molecules in material such as connective tissue in meat, starch granules, cell walls in plant material, shortening, and frozen foods.

2. Size, shape and orientation of crystals can be determined by color. A uniform color throughout a particle indicates it is a single crystal. A patchwork of colors indicates many crystals agglomerated. Color zones with dark bands in between indicate fibrous crystals arranged in a radiating pattern. Starch granules and fat crystals have the latter structure.

3. Material can be identified by color of crystals. For example, particles of baking soda in a powdered mixture such as a prepared mix, are easily identified by multi-colored fringes around their edges.

Like polarized light, X-ray diffraction depends on orderly arrangement of atoms and molecules in the crystal. A beam of X-ray passing through a crystal is deflected (diffracted) at various angles, depending on the spacing within the crystal. Thus, by measuring the angles one can determine the spacings and identify the material. This technique is useful for detecting presence of crystals.

Thermal analysis is the measurement of the amount of heat associated with changes from amorphous to crystalline state, and vice versa, and the temperature at which the heat changes take place.

We have developed an apparatus for automatically

(*Turn to page 204*)

• • •

Foods in Patty Form Build Acceptance

Extra convenience and hence appeal are offered by these ready-to-cooks. At Deerfoot, sausage type is shaped by high-speed unit that will handle any extrudable food

GIVE THE CONSUMER handiness and economy in a quality food and it's a good bet you'll come up with a very saleable item.

A case in point is the ready-to-cook sausage patty made in a high-speed extrusion operation at Deerfoot Farms Co., Southboro, Mass.

While also permitting the housewife to serve sausage in an added form, this patty's further attraction is ease and speed of preparation—particularly important to the increasing number of women employed outside the home.

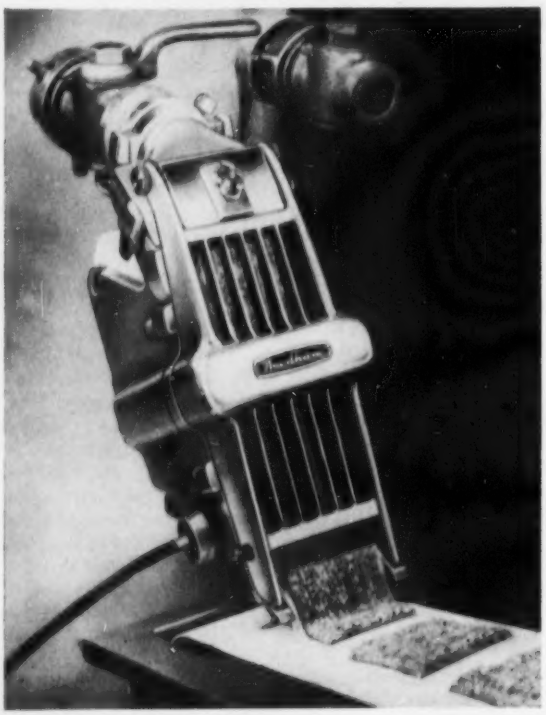
Another appeal is the price saving, since patties save the cost of sausage casings.

At Deerfoot, efficient production of the new item centers about an 80-per-min. patty former (Needham Mfg. Co., Needham Heights 94, Mass.) easily mounted on the stuffer. Performing two operations in one, it automatically extrudes a ribbon of sausage meat, then ejects the patties, on paper, to a conveyor.

Alternately, the product could be hamburger patties or specialty steaks, formed at 40-80 per min., depending upon grinder speed.

► **Furthermore, this unit forms patties of any food suitable for extrusion, such as fish and potatoes.**

Finished in buffed aluminum and stainless steel, the machine fits on various size choppers. It has only one moving part—a solenoid-actuated guillotine knife (110v. 60 cycle, single phase) that cuts the ribbons of meat and paper. Design simplicity offers dependable operation and easy cleaning.



80-PER-MIN. EXTRUDER, attached to sausage stuffer, automatically turns out various sizes and shapes of patties onto individual papers. Solenoid-operated guillotine knife "portion-cuts" both the meat and paper.

A simple dial adjustment sets the unit for patties of from 2 to 8 oz. without use of extra parts. A thumbscrew varies patty thickness from ¼ to ¾ in. Product may be 3½x3½ in. square, or a rectangle 3½ in. wide and from 3 to 5 in. long.

In the sausage operation, patties are taken from the conveyor and packed four units (2-oz.) to a box. Distributed either deep frozen or under refrigeration, the package permits easier stacking in storage and boxing for shipment because of its handy square shape.

COMING FROM FRYER (A), sticks drop onto stainless-steel conveyor that carries them under precooling suction hoods (B) before entering cooler. Operator checkweighs sticks and removes imperfect ones.

ROTATING SWEEP ARM (arrow) is synchronized with infeed conveyor, transfers row of sticks to baskets.

Controlled Cooling:

Key to Quality Fish Sticks

Handling 1,500 lb. of sticks per hour, this continuous, automatic unit curbs bacterial growth, improves product

LEONARD TRAUBERMAN
Assistant Editor, "Food Engineering"

Operation of today's high-speed fish-stick line calls for quick cooling of the sticks as they leave the fryer.

But rapid cooling is even more important from the standpoint of quality control. For with a perishable such as fish, it is essential to drop product temperature as quickly as possible—without condensation—to keep bacteria counts low.

Fast cooling also prevents fat-staining of the package by permitting surface fat to solidify into the breading.

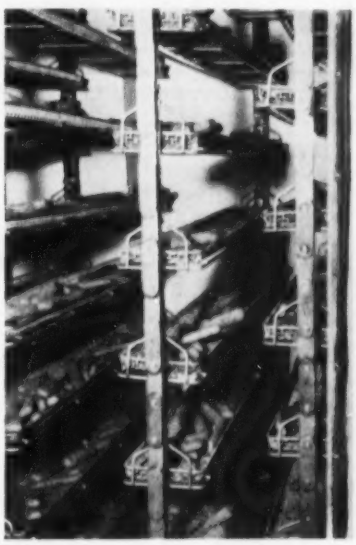
Such controlled action is afforded by two continuous, automatic coolers—each handling some 1,500 lb. of sticks per hour—at Teddy's Frosted Foods, Inc., New York. Units are part of complete breading-frying lines built by Doughnut Corp. of America, N. Y.

In Teddy's operation, fish (mostly cod) arrives as frozen blocks which are cut into sticks. They are battered and fried before going to the cooler on a stainless-steel link conveyor.

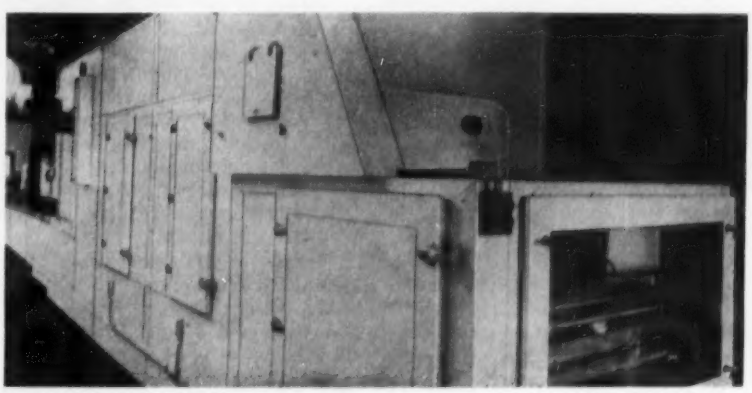
Internal temperature of the sticks leaving the precooling section of the fryer ranges from 120-160 deg. F., depending on the load. Further precooling occurs as sticks pass under suction hoods mounted above the cooler's infeed conveyor. Therefore, sticks enter the cooler at 110-140 F.

Inside the cooler, a mechanical

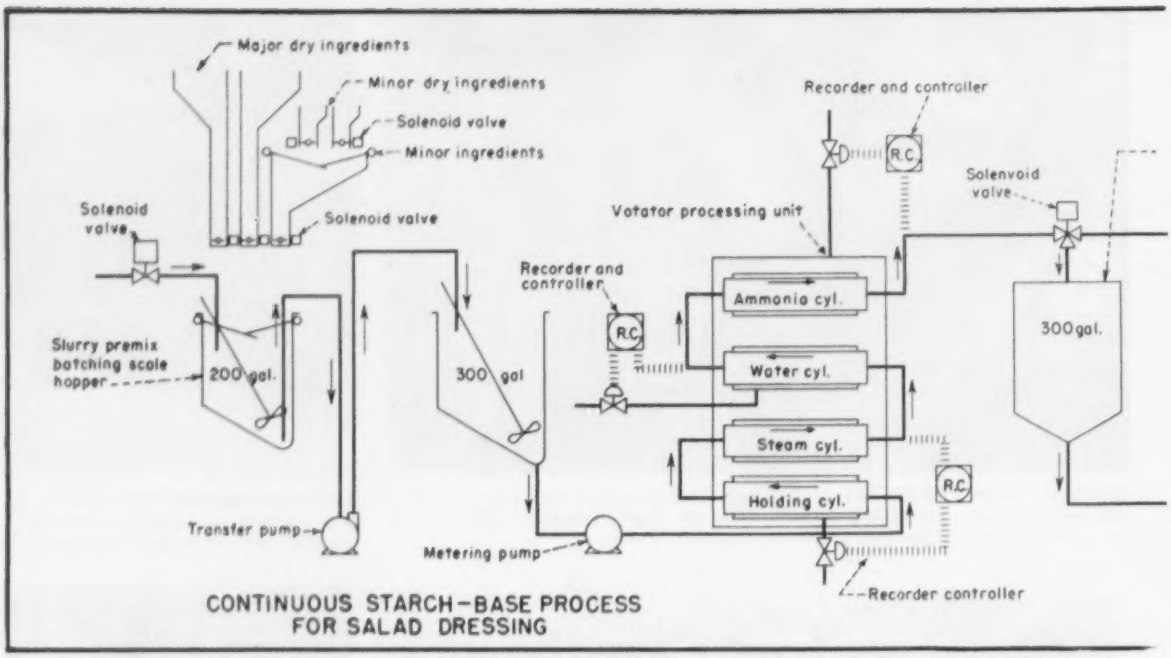
(*Turn to page 189*)



WIRE-MESH BASKETS, suspended from vertically moving chains, carry product past 40-F. air to discharge end. Cooling time: 15 min.



ENAMEL-COATED COOLER controls product quality, saves space, and enables efficient materials handling. At discharge end (left), its baskets level off to form a conveyor-packoff table.



AUTOMATED LINE for making salad dressing at 5,000-10,000 lb./hr. also adapts to streamlined, mechanized

How Automation Techniques Can

Latest in-stream sensing devices are proposed for specially-modified manufacture of these items . . . Instant, foolproof control is accented

M. H. JOFFE
President, The Emulsol Egg Products Corp., Chicago

That word "automation" may put us in mind of straight-through automatic production with continuous flow replacing the batch system.

▶ **But in many phases of food processing, non-stop operation can actually be achieved by modifying the batch system.**

And whatever the approach, a high degree of mechanization is demanded —not only in processing but also in storing and handling materials, in packaging, and in storage of finished product.

Thus, while it's true that mayonnaise and salad dressing have been made continuously, with many steps automatically controlled, nevertheless it is only through complete mechanical integration that we get the fully-automated process.

Here, we will specifically consider the needs of both large and small plants.

For Smaller Operations

Taking first the minimal layout, we find that the degree of automation is determined by economic and technological considerations. Small-scale operations can be profitably carried out with simple batch-type equipment, thus complete automation would not be economical.

Before deciding upon the amount of automation that feasibly may be used, one must consider three factors:

1. Type of equipment available or possible to develop.

2. Cost of units.

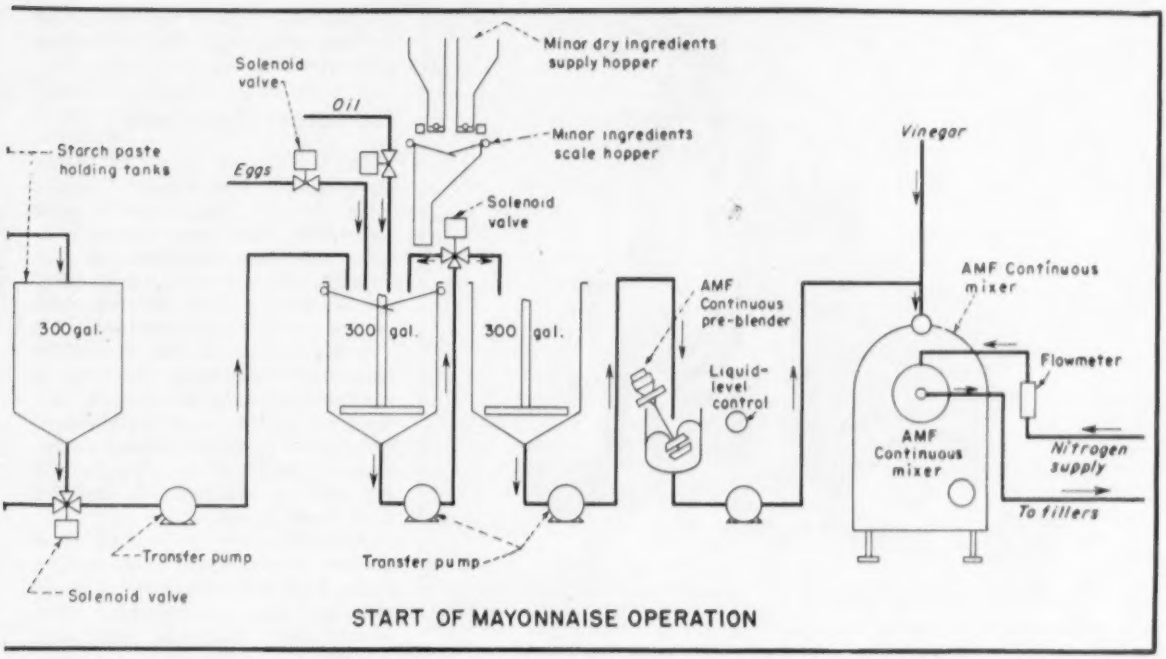
3. Savings and other benefits from its use.

Initial cost may be high. Yet the manufacturer who continues to employ obsolete equipment and methods stands the risk of being outstripped by his more progressive competitors.

The small plant using a batch system makes mayonnaise in a vertical-type beater or in a Case machine, which more readily lends itself to instrument control. Eggs, salt, sugar, spices, and liquids can be mixed and kept cold (under 40 F.) in a jacketed tank. Required amounts of chilled oil (45 F.) and egg slurry can be pumped into the Case mixer and blended for 3-4 min. Mixing may be automatically controlled by a time relay. Finally, the batch can be mechanically or automatically discharged through an air- or electrically-actuated valve.

It's a question of whether such instrumentation is economical.

To make salad dressing the processor adds a starch base usually made in a vertical batch-type cooker. At present, all materials for a complete batch can be mixed in a slurry tank and then pumped into the cooker through an in-the-line strainer. Cooker



production of mayonnaise by omitting preparation of a starch base. (Drawing by Votator Div., Girdler Corp.)

Robotize Mayonnaise, Dressings

agitator is started, and batch is brought up to about 193 F. with steam. It is held for about 3 min., exact time and temperature depending upon type of starches used.

Starch base is then either pumped into a cooler or chilled in the cooker to 85-90 F. Cooking temperature can be automatically controlled by a special steam valve that shuts off at a predetermined temperature (about 193 F.).

After the batch is held at this temperature for 3-4 min., it can be discharged into the cooler, with a time-relay actuating the discharge valve.

We find it questionable whether instrumentation can be economically used on a small batch scale for proportioning the starch base and other materials into a mixer for subsequent blending of them into a salad dressing.

New Unit Appearing

However, a new emulsifying-mixing unit (W. M. Sprinkman Corp., Milwaukee) does lend itself to automatic proportioning and blending of ingredients through a time relay. This unit has a capacity of 1,000 gal. per hr., about ten times that of the vertical machine.

It consists of a 125-gal tank with "teardrop" design, and employs a special agitator actuated by a 2- or 4-speed motor. All valves are pneumatic. Discharge valve at bottom of unit is connected to a variable-speed pump and a variable-emulsifying orifice head. There are no packing glands at pump or at agitator shafts—an important sanitary feature.

In making mayonnaise, oil is chilled to 45 F. in coil-type tanks or plate-type heat exchangers. At present, it is not economical to prepare the egg slurry automatically, although it can be done readily. Instead, egg yolks in 30-lb. cans are allowed to thaw. They are then dumped into a jacketed tank equipped with an efficient agitator, and salt, sugar, spices, water, and vinegar are incorporated in correct proportions.

Batch is then discharged through an in-the-line strainer to a jacketed holding tank of desired capacity, and kept at 35-40 F. Holding tank is connected to an automatic scale tank.

The orifice-type emulsifier is operated from a control panel and can be sequence-timed. With agitator initially set at low speed, the valve leading to the egg-slurry source opens to admit material to the mixing chamber. Simultaneously, the circulating valve and variable-speed pump are actuated.

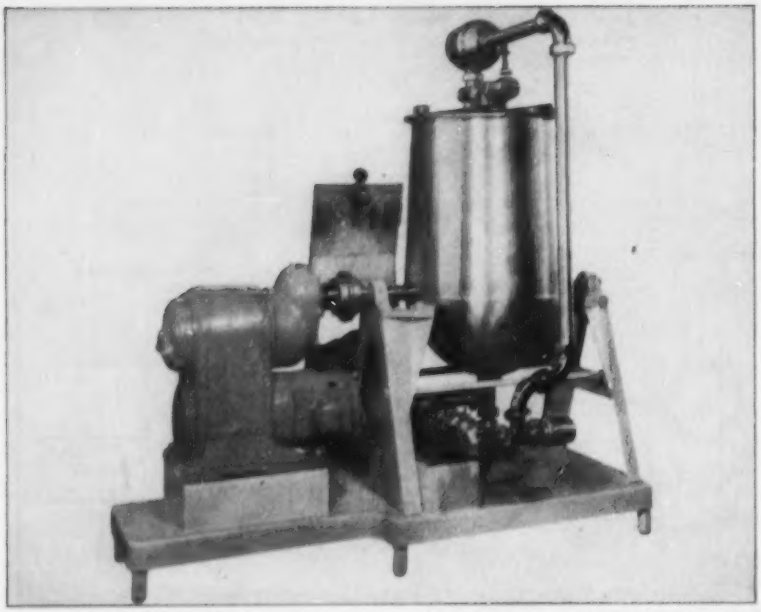
When correct amount of egg slurry has been added, the slurry valve automatically closes, and an oil meter, equipped with automatic stop, goes into action. Circulation continues during flow of oil and agitator speed increases proportionately. After the oil is incorporated, circulation and mixing continue for a preset time,

Plant of Tomorrow

One can visualize, in the not too distant future, a fully automated mayonnaise and salad dressing layout that will operate from a central-control room.

Here, the production schedule for the day will be fed into some type of "intelligence reader" that will translate the data into a form usable by a computer. And the entire system will then be sparked to perform the processes.

After filling, capping, labeling, and casing, operations will automatically cease as the required number of cases of each product have passed a given point.—*M.H.J.*



NEW COMBINATION emulsifier-mixer has 125-gal. teardrop-shaped tank (right), with finger-type agitator operated by vari-speed drive (left). Orifice-type emulsifier head (over tank) permits variable setting.

during which nitrogen may be introduced.

Then, a divert valve opens automatically, and batch is discharged to the desired level by a level-sensing device. Latter closes the divert valve and actuates the time-sequence mechanism for re-cycling.

It might be noted at this point that a premixer-colloid mill combination can substantially duplicate this job.

As previously mentioned, salad dressing requires starch base along with oil and egg material. In small plants, the base can be cooked and cooled in the usual way, then pumped to a holding tank. From here, it can be metered (along with oil and egg slurry) into the emulsifying-mixing unit, using an electronically actuated proportioning-type pump.

In bigger plants, starch base can be automatically cooked and cooled by continuous equipment presently available—the Votator heat-exchanger cooking unit and the Walker-Wallace plate-type heat-exchanger cooker.

For Larger Operations

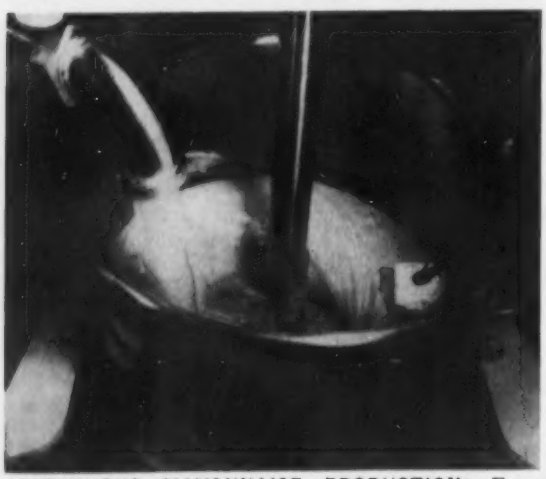
In a setup for preparing starch slurry, proposed by Girdler Corp., a series of weigh hoppers can be used for starch, sugar, water-vinegar mixture, and minor ingredients such as blended salt and spices. Ingredients are added to a slurry tank which is part of a weigh-scale assembly.

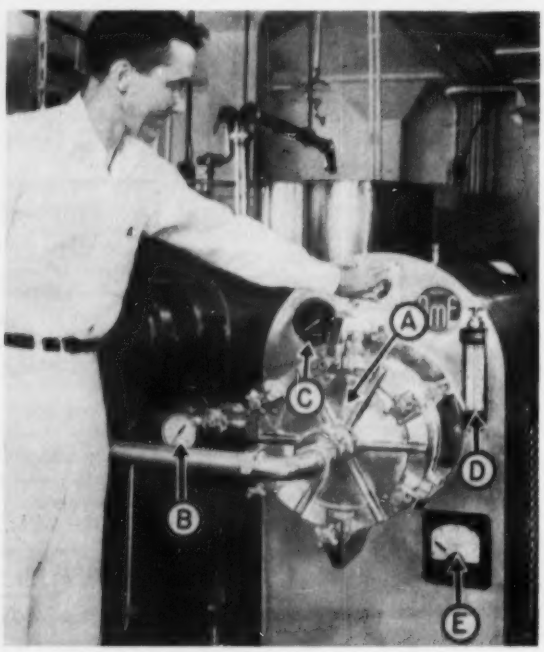
Scale is equipped with adjustable, interceptor attachments. Each has a photo-electric tube mounted in the scale, and each is connected to a control cabinet by relays necessary to operate discharge valves of ingredient hoppers. An interceptor is used for each major ingredient.

After the slurry is prepared, it is pumped to the starch-slurry holding tank. Equipped with a level-sensing element, this tank supplies the Votator unit. The whole operation is actuated when slurry reaches the lower level in the tank, and it can be sequence-timed or punched-tape controlled.

Here is how starch slurry would be made automatically:

When the control system is actuated, flow of water-vinegar mixture into slurry tank begins, and it continues until first interceptor point is reached. Liquid-discharge valve is automatically closed, and agitator starts. Immediately, second ingredient flow begins. Each interceptor point on the scale dial represent cessation of one ingredient flow and start





CONTINUOUS MAYONNAISE PRODUCTION: From specially designed, efficient disk-type blender (above), oil-egg-seasoning mix is metered into AMF continuous mixer (right). The mix fed into blender also contains 20% of the water-vinegar solution used, while remainder is proportioned into mixing head (A) during emulsification. Gages on mixer register pressure (at B), rpm. (C), air flow (D), and amperes (E).

of the next as electric eyes are tripped by movement of the dial pointer.

When all ingredients are proportioned, additional agitation is employed and batch is then automatically transferred to slurry-supply tank. The system now is idle until level of slurry-supply tank calls for preparation of another batch.

This system is flexible, since electric-eye batch points are readily adjustable for formulation changes. Also, number and amount of ingredients may be increased or decreased without major effect on cost or complexity of installation.

Compared with continuous proportioning and mixing, this system involves fewer moving parts. And it features specially engineered and comparatively standard components.

Cooking and cooling of starch base is carried out in the conventional 4-stage Votator cooking unit. Slurry (1) is metered by Votator feed pump from supply tank to the first cooking cylinder, (2) held at cooking temperature in the next, and (3) cooled in the last two cylinders under controlled conditions. Cooled base is then continuously discharged into two 300-gal. starch-base storage tanks.

From these tanks, required amounts of base, oil and egg for each batch of dressing go to the orifice-type emulsifying-mixer.

Another Continuous Setup

A different principle is employed in the Girdler-AMF continuous system for manufacture of mayonnaise and salad dressing (see drawing). Two 300-gal. tanks, equipped with bottom, flat-type agitators (designed to keep ingredients in suspension without effecting emulsification), are used at premix tanks.

Oil is metered into first tank. Then, by either automatic-stop control on oil meter or through use of a scale equipped with an interceptor attachment, flow of egg slurry begins and agitator is simultaneously started by a relay that activates the agitator motor. After correct amount of egg slurry has been discharged, base-metering pump is started and correct amount of base incorporated. The same cycle is employed for second tank.

When premix tank cycle is complete, discharge valve is automatically opened and the thin, oily premix is pumped into a disk blender. This unit consists of a 40-qt. standard, round-bottom mixing bowl mounted on a tripod stand. It has a 3-in. sanitary bottom outlet and a 875-rpm. impeller directly connected to a 7½-hp. motor drive.

Impeller consists of two truncated cones designed so that material fed into blender is whipped into two doughnut-shaped rings, one above the other. Variation in height of top doughnut (which may be 1-2 in.) is

(*Turn to page 100*)

• • •

Automatic Elevator Keeps Crowns Feeding to Machine

FE STAFF

They had a special problem at the plant of Falstaff Brewing Corp., San Jose, Calif.

Replenishment of the supply of crowns in the hopper above the bottle crowner called for the operator to climb a short ladder, carrying with him a carton of the crowns. At times, however, he wouldn't use the ladder. Instead, he'd clamber up the machine itself, to take a stand on a level near the unit's moving parts while he poured in the crowns. **►To eliminate this laborious, sometimes dangerous, and somewhat insanitary operation, Falstaff designed an enclosed elevator that curves "up-and-over" to feed this machine hopper.**

The lifting mechanism comprises a 4-in. endless rubber belt equipped with ½x1-in. wooden strips fixed horizontally across it at 6-in. intervals. It is powered by a ½-hp. motor.

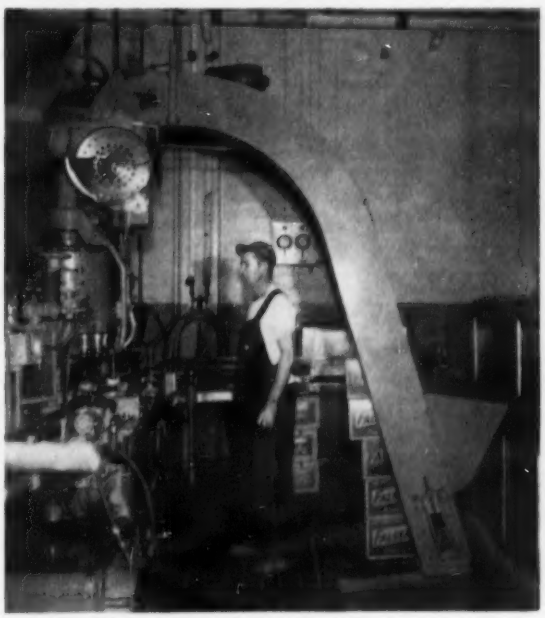
At its start, near the floor opposite the crowner, this belt forms the fourth side of an easy-to-fill hopper. Once this hopper has been loaded, the elevator belt picks up the crowns and carries them from this low-level point to the feed hopper atop the crowner.

Robot Action

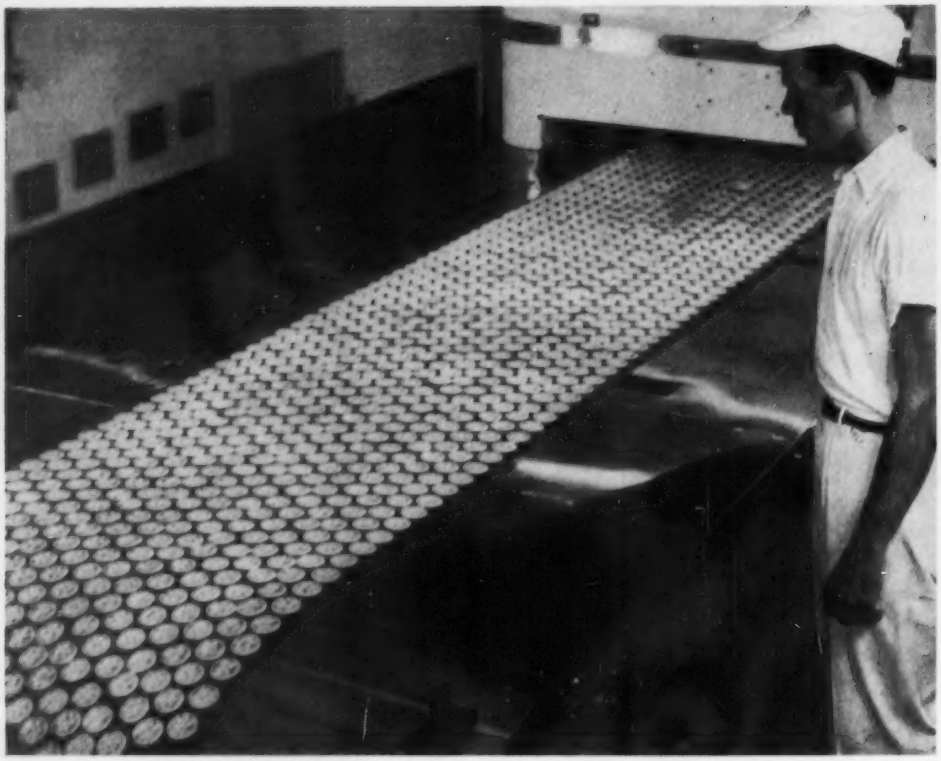
Dropping from the belt into the high hopper, the crowns first fall upon a horizontal, counterweighted, hinged plate, located slightly below the top of the unit. Under their weight, this plate tilts, and then the crowns slide off, to be used by the machine below.

As the supply of crowns on the plate diminishes, the counterweight gradually returns the plate to its original position. Thereupon, a limit switch is closed, again setting the elevator in operation to repeat the cycle.

Thus, the whole feed system is automatic as long as the floor hopper is kept supplied.



"UP-AND-OVER" LIFT abolishes old tedius, risky climbing to supply this machine with bottle caps. Operator need only load lower hopper (right), then unit runs by itself. Mirror (upper left) gives him view of flow into top hopper. Note that installation leaves aisle clear.



1—UNDER HIGH HEAT these belts aren't fazed, even in 800-deg.-F. bake ovens.

STEEL-BELT CONVEYORS

WHEN to Use Them . . . HOW to Maintain Them

OSSIAN EK

Manager, Conveyor Division, Sandvik Steel, Inc., Fair Lawn, N. J.

Both carbon-steel and stainless-steel conveyor belts have fulfilled vital needs in varied and essential applications in food plant operation.

The characteristics of these steel belts set them apart for specific applications, particularly in these four major in food plant operations:

1. **Processing at high or low temperatures.**
2. **Transporting sticky products.**
3. **Accumulating cans, jars, or other containers.**
4. **Conveying over very long distances.**

The steel belt made of flexible cold-rolled strip steel has the ability to withstand heat and resist corrosion. Their high heat-transfer rate makes them specially adaptable for continuous operations over wide temperature variations.

And having a hard, impenetrable surface, they are selected for handling sensitive materials so that they do not pick up odors or off-flavors.

Because of these qualities, the steel conveyor plays an important part in operations integral to the processing of many foods, reducing costs and protecting quality.

In many packing plants, the preparation and processing of meats is via steel belt conveyors, since they are impervious to bacteria and corrosion. Here, they are easily scraped clean while in use, and they are quickly and economically washed and sterilized at the end of operations.

In canning plants, steel belt conveyors often serve as accumulators for containers. When the belt movement of cans or jars is unimpeded, travel is in-line. However, in event of a stoppage, containers spread out over the belt (on which they slide with negligible friction). Thus, they accumulate until the cause of the clogging is removed, or until the accumulating area is filled, whereupon the unit is stopped, either automatically or manually.

Steel belt lengths up to 300 ft. are stocked. Longer belts are fabricated from stock lengths. Belts of steel as long as several thousand feet have been operated successfully.

Thickness of stock belts varies, the range being .016 to .063 in. Single-piece units are obtainable in widths up to 32 in. Wider belts are fabricated by joining two or more lengths side by side.

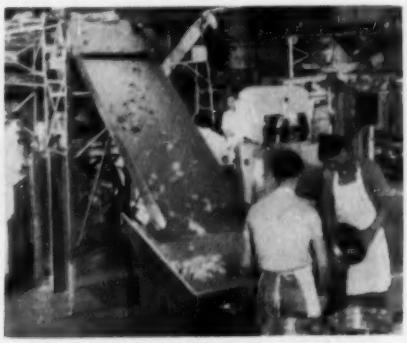
These wide belts are extensively employed in the baking field. In the ovens—especially those for cookies, crackers, and biscuits—the belts often run 300 ft. or more in length. Temperatures up to 800 deg. F. may be required, and so the steel belt is ideal here.

Another important use is for conveying through the tun-

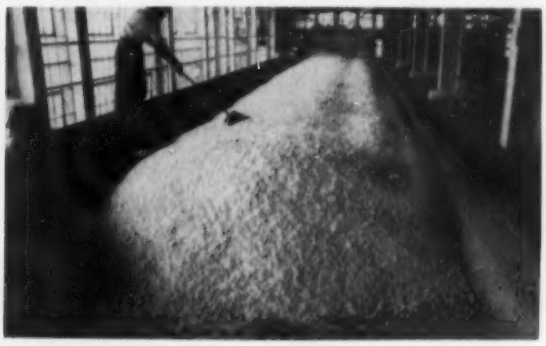
2—**FOR COOLING** they're also ideal. Here ten of them help harden chocolate drops.

3—**"SENSITIVE FOODS** are sped without pickup of odors or off-flavors. Seen is margarine operation.

7 Functions In Focus



4—**LIGHT TRANSPORT** finds them routine. This is "long-carry" of potato chips.



5—**HEAVY TRANSPORT,** too. Here a wide, high-capacity belt moves a big batch of cube sugar.

nels where icings on cakes and sweet goods are cooled and hardened.

When the steel belt is selected for use in sardine or tuna fish processing, the reasons are much the same as in the meat industry, with at least one additional objective.

This is the extra accent on the fact that foreign-odor-sensitive fish are not affected by the steel conveyor. Its smooth surface is readily cleaned and washed to keep it free of both odors and bacteria.

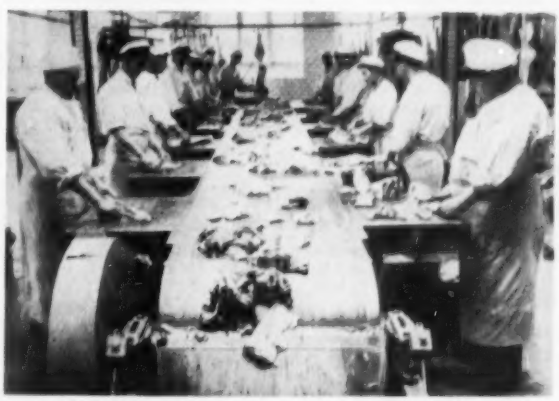
Raw sugar's stickiness causes it to cling to belts. But when the steel type is employed, such sugars are easily scraped from the smooth, hard surface, and without danger of gouges or other injury to the belt.

Another sugar-refinery application is the handling of cubed sugar. As in the case of raw sugar, handling here is confined within side skirts, which can be located very close to the belt, thus allowing only a very small crack between the two.

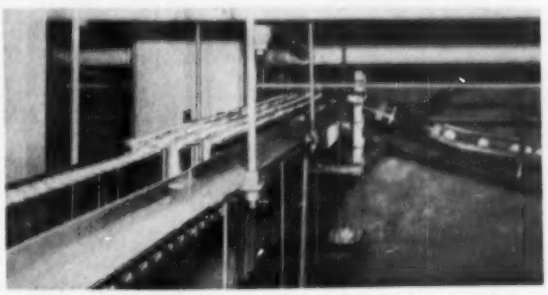
Since stainless belts do not absorb cooking oils, and also since they resist the corrosive effect of both antioxidants and salt, they are finding increased use in potato-chip plants. Available in 18-8 type stainless, these belts, when kept clean, do not in any way contaminate the product. For similar reasons, steel belt conveyors are assets in margarine manufacturing plants.

Where candy and confections are processed, steel belts are employed in cooling tunnels. They are also used to provide a cold, hard surface for the self-shaping confections. These are deposited soft to form and harden identically on the belt.

Rapid heat transfer of the steel belt in a very important asset in this operation. The belts may be cooled by air blast or by cold water sprayed on the under surface of



6—**ADHERING FOODS** are cleanly carried, since belt surface is hard and impenetrable, and so unaffected. "Doctor" blade removes meat and returns belt spic and span.



7—**ACCUMULATING** of cans for feed operations is steel belt's ready forte, since surface gives easy "slide."

the belt. Quality control of size and shape of confection is thus readily maintained.

Recently, the steel belt has been adapted in the manufacture of puffed confections, and also in several different methods of preparing instant coffee. All of these processing operations are carried out under vacuum. The steel belts, on which the product is conveyed during the time moisture is evaporated from the products, operate inside a vacuum chamber.

Hp. and Drive Requirements

Conveyor drives are usually of chain type. This drive is preferable because the conveyor speeds are slow, and it allows bearing adjustment at the drive pulley.

Horsepower required to drive conveyors will vary, of course, depending on width and length of the belt and the load transported. However, since friction between belt and rollers is small, and since the belt in rounding the pulley has a spring-like action and tends to push itself around, horsepower requirements are low.

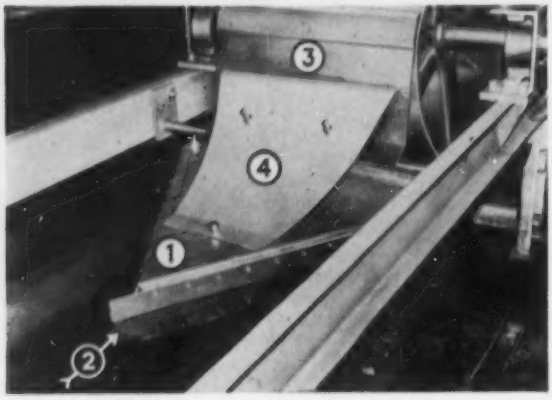
For many steel belt conveyors, especially the smaller ones, fractional horsepower motors are sufficient.

Now about idlers: Since these devices contribute so materially to the performance of the steel belt conveyor, their selection and installation are very important, as are also frequent inspection and maintenance.

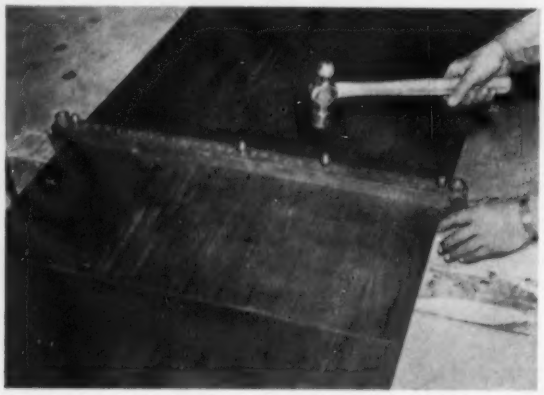
Correct spacing of idlers depends on technical aspects as well as the loads the belt carries. Here's a rule to serve as a safety guide: The angle made by the belt leaving an idler should never deviate more than a frac-

(*Turn to page 203*)

Cleaning Device, Repair Closeup



TO PREVENT any solid foreign material from rounding pulley and so damaging belt, plow-like device (1) is set to ride on return strand of conveyor (2). Cleaner blade (3) curbs any build-up of adhering substances on pulley. It's held against pulley surface by sheet-spring (4).



"DIE-BAR" IS USED as guide for punching rivet holes when joining belt ends (as above) or splicing-in a new piece. Next, holes will be countersunk. And after rivets are in, their heads will be filed to smooth them down level with the belt surface.

AVAILABLE THICKNESSES OF STEEL BELTS

Carbon and Stainless

Belt width (in.)	CARBON thicknesses (x.001 in.)									STAINLESS thicknesses (x.001 in.)					
	16	20	24	32	36	40	48	55	63	16	20	24	32	40	48
4	X									X					
6	X									X					
8	X	X	X	X						X	X	X			
10			X	X							X	X	X		
12			X	X						X	X	X	X		
14			X		X							X	X		
16			X		X							X	X		
18			X		X							X	X		
20						X						X	X	X	
24				X		X	X					X	X	X	
28							X						X		
32						X	X		X			X	X	X	X
34*					X	X									
36*						X	X	X					X	X	
46*						X	X						X	X	
54*							X	X					X	X	X
62*							X						X	X	X
69**						X								X	
81**							X								
92**							X							X	X

* Made up of two narrower belts longitudinally jointed. ** Made up of three narrower belts longitudinally jointed

QUICK RULE-OF-THUMB

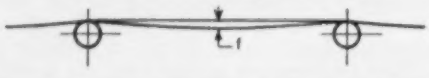
For Finding Horsepower Needed To Drive Your Steel-Belt Conveyor

Rapid calculation of motor-drive requirements may be made with this formula—

$$\text{Hp.} = \left[\frac{W+Q}{40}\,(A+L+B+S+QH)\right]\frac{V}{33{,}000}$$

—where W is belt weight in lb./ft. . . Q is load in lb./ft . . . A is 600 for single belt, or 800 for belt with longitudinal joint, or 1,100 for belt with two longitudinal joints . . . L is center-to-center pulley distance . . . B is 20 for belts sliding on metal, or 30 for those sliding on wood . . . S is sliding length . . . H is height of lift in inches, and V is speed in ft./min.

Chart Shows Proper Belt Sag For Various Spacing of Idlers



Return idler spacing	feet	10–13	13–16	16–20	20–23	23–26
Sag of belt f	inches	7/8	3/4	1 1/4	1 7/8	2 3/8

WHAT IS BEING DONE with Mylar in packaging foods is typified by these six applications, each of which has somewhat different requirements.

Mylar Breaks Barriers To Wide Application

Now heat-sealable, this clear, tough, heat-resistant film meets many advanced requirements

MYLAR POLYESTER FILM, the new material with many unique properties, has "arrived" in food packaging. This was in evidence at the recent Packaging Exposition in Atlantic City.

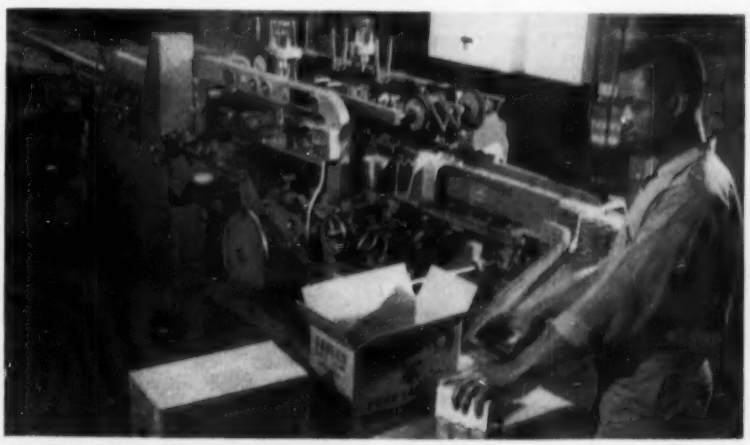
A wide range of applications of the strong, brilliantly clear, high-heat-resistant film were shown. And sealing the film on slightly modified standard wrapping and bundling equipment—a research achievement out of the new du Pont packaging laboratory — was demonstrated.

Here are typical Mylar applications: A macaroni specialty is wrapped in the polyester film to achieve complete visibility, while affording product protection (De Martini Macaroni Co., Brooklyn, N. Y.). Another macaroni item, made by Procino-Rossi Corp., Auburn, N. Y., is packaged in a carton with a highly transparent, break-resistant Mylar window.

Taking advantage of the high-temperature properties of the film, Luchow Products Corp., New York, uses it as a heat-in-the-package container for precooked frozen products, such as beef goulash with noodles. Here the sealed envelope containing the product is inside a paperboard carton. The high strength of the film is utilized in a brilliantly transparent bag for fresh apples packed by Lloyd Garretson Co., Yakima, Wash.

Frankfurters are vacuum-packed in a Mylar-polyethylene laminated film

(*Turn to page* 156)



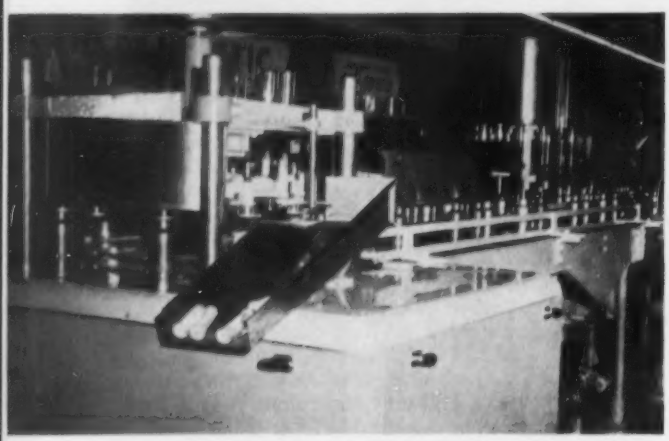
HEAT SEALING having been achieved on a fast production-line basis, Mylar now is used to bundle cartons of flavor extracts at the C. F. Sauer Co. plant in Richmond, Va. The machine is a Hayssen unit.

Spotlight on

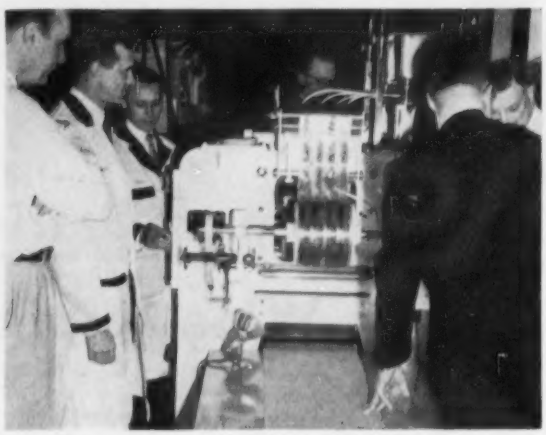
69 Latest Packaging

8 Fillers

HERE, filling machines are automatically set to correct for over- and under-weight. Calculator does it, dispatching signals from check-weight scale when operator places package on it. Readings also recorded on strip chart.—Scale Specialties & Systems, Inc., Roseland, N. J. (70A)

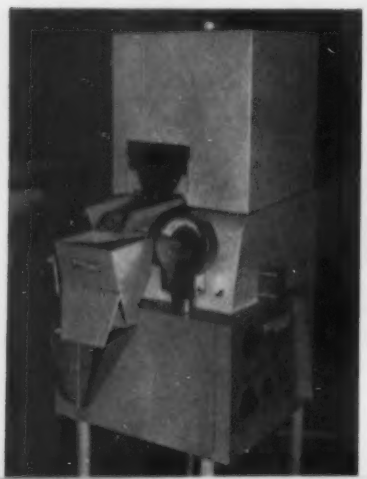


LATEST MACHINE automatically fills new-type plastic bottles upside down. Then bottom disks are dropped into position by operator and sealed in place. Unit then ejects closed containers from metal holders onto conveyor at up to 180 per min.—Horix Mfg., Pittsburgh. (70B)



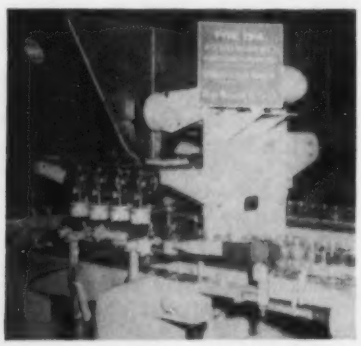
SOLIDS, LIQUIDS, POWDERS are filled simultaneously in same or different-sized flexible packages at rates to 400 per min. on this new unit. Machine forms packages directly from roll, then fills and heat seals.—The Bell Machine Co., Oshkosh, Wis. (70C)

PRECISION SCALE and electronic controls give high accuracy in this small weighing-filling machine for dry materials. Dials (right) control feed, and precision, enable instant weight checks.—The Trescott Co., Fairport, N. Y. (70D)



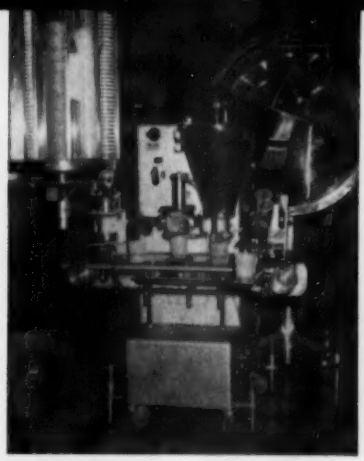
AUTOMATIC SCALE bulk-weighs grains, beans, frozen foods, and other free flowing materials, in 10 to 100-lb. range. Makes eight 10-lb. or five 50-lb. weighings per min. Manufacturer: Pack-Rite Machines, Milwaukee. (70E)

4-PISTON machine fills viscous products in glass jars, plastic bottles, tin cans, or paper cups 100/min. Handles ½-22 fl. oz. size. Special nozzles assure dripless operation. Maker: Hope Machine Co., Philadelphia. (70F)



Units

Profusion of new fillers, bundlers, strappers, labelers, and pouchers on view at 25th AMA National Packaging Exposition at Atlantic City. Also forming, capping, cartoning, coding, bagging, wrapping, sealing, counting, casing, handling equipment . . . 11-page feature



FILLER-CAPPER mounts new 12-column dispenser for nesting cups (left) and an automatic capper (right) that applies deep-skirted lids at 50/min.—Anderson Bros. Mfg. Co., Rockford, Ill. (71A)

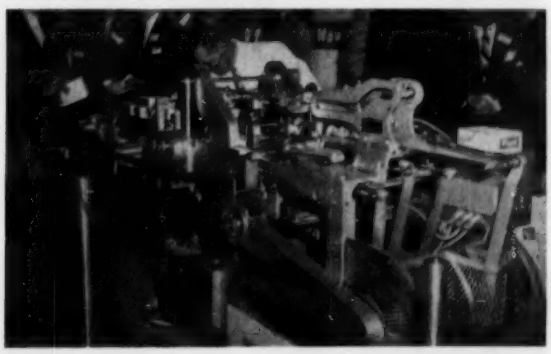
COMBINATION filler-capper handles dry products at up to 80 paper cups per min. Stacked cups and lids are automatically dispensed from magazines. Maker: Anderson Bros. Mfg. Co., Rockford, Ill. (71B)

3 Bundlers, Strapper

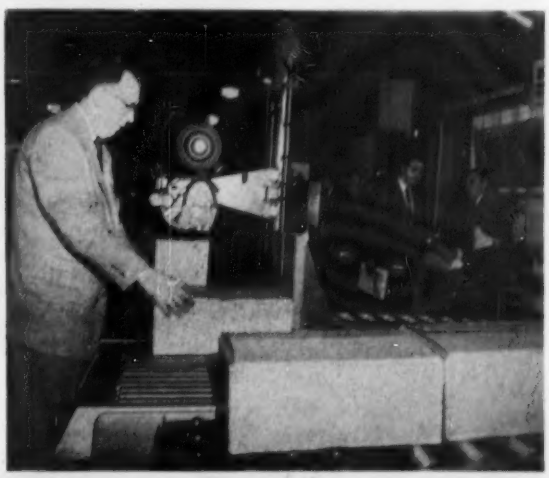
PACKAGE BUNDLER seals 2 to 3 packages at a time with pressure-sensitive tape fed from two rolls. Operates at 60 per min. Maker: Minnesota Mining & Mfg. Co., St. Paul. (71C)

BUNDLER employs thin-gage Mylar polyester film to group-package carton-packed items. Benzyl alcohol is applied to film with roller applicators. Maker: Package Machinery Co., E. Longmeadow, Mass. (71D)

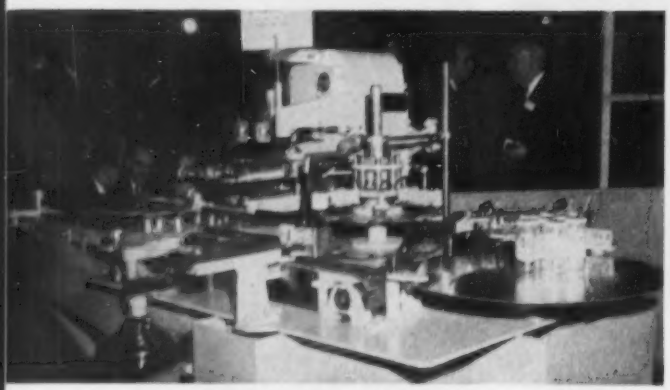
THIS MACHINE uses Mylar polyester film in accumulating and bundling of cartons. Unit is equipped with two static eliminators and Teflon-impregnated glass cloth over sealers.—Hayssen Mfg. Co., Sheboygan, Wis. (71E)



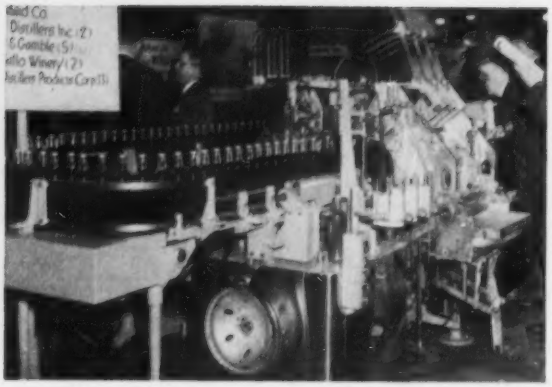
ELECTRIC MACHINE tensions metal strap as it cuts it from the coil to make a welded joint in strapping shipping cases. Time cycle of machine is less than 3 sec.—Acme Steel Co., Chicago. (71F)



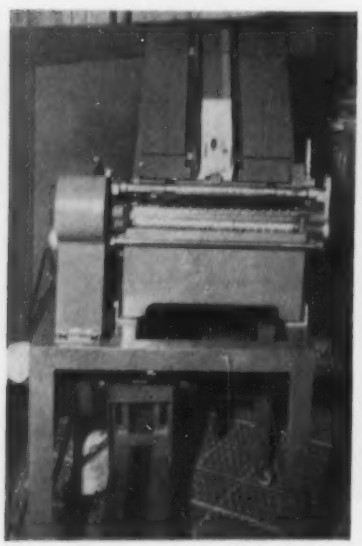
6 Labelers



STRAIGHT-THROUGH labeler operates at up to 240 bottles a min. Features multiple label application, positive container control, safety devices, and simplified lubrication.—Economic Machinery Co., Worcester, Mass. (72A)

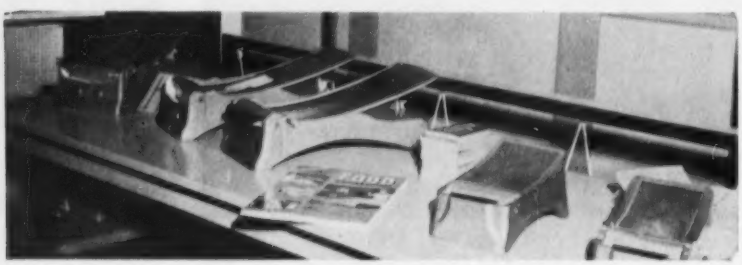


GLUE LABELER runs at 20 to 60 bottles a min. Handles flats, squares, and odd-size labels. Works on any size or shape of bottle, from smallest up to gallon.—Biner-Ellison Machinery Co., Los Angeles. (72B)

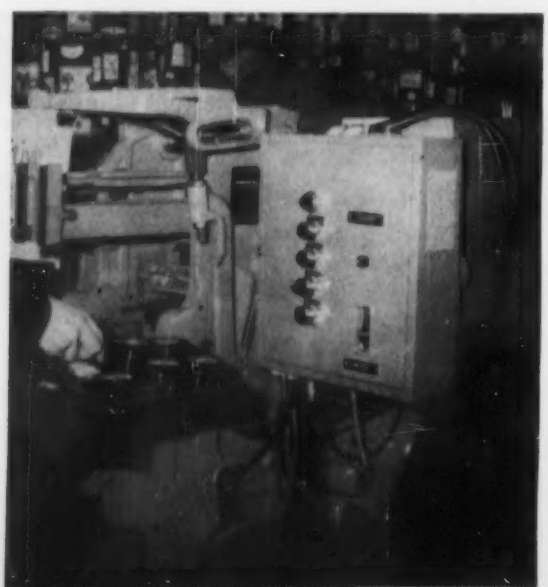


GLUE-TYPE UNIT has semi-automatic label feed. Operator touches lever, then labels are registered onto container. Can be used as a straight label paster for gumming labels.—Kenneth J. Moore & Co., Chicago. (72C)

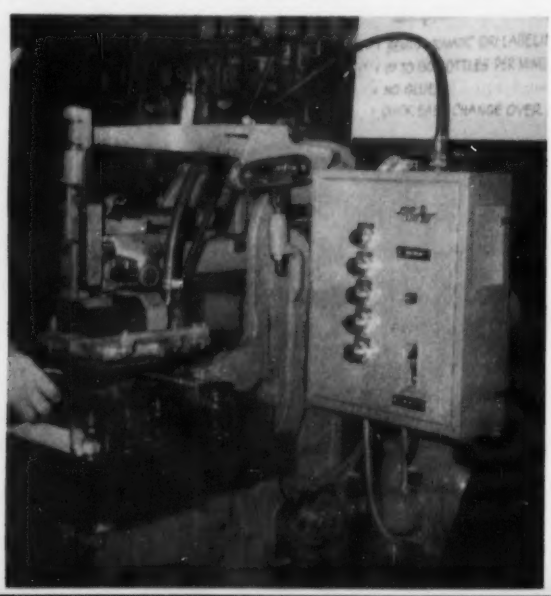
NEW LABEL DISPENSER has patented abrasive surface for retarding and holding all remaining labels. Only one label is drawn from stack at a time, regardless of how rapid or careless the hand motion. Reaches 2,500 labels/hr. rate. Moistens labels for good adherence. Maker: Dispens-A-Label Devices, Pittsburgh. (72D)

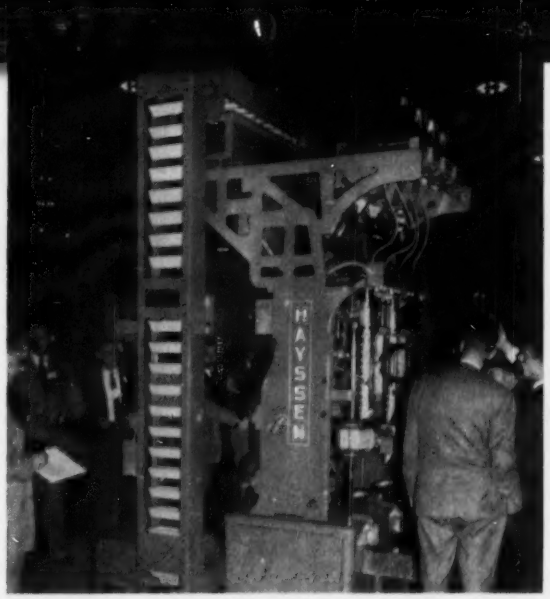


THIS MACHINE is designed to handle pressure-sensitive top labels. Applies them at 60 a min. Available with code attachment.—New Jersey Machine Corp., Hoboken. (72E)



SEMI-AUTOMATIC thermoplastic jar labeler. Runs at up to 60 containers per min. Exhibitor: New Jersey Machine Corp., Hoboken, N. J. (72F)

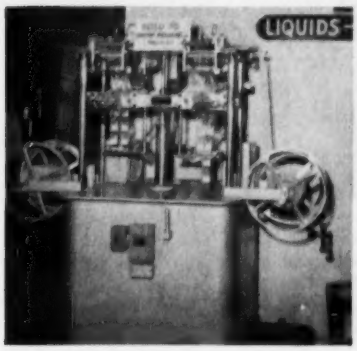




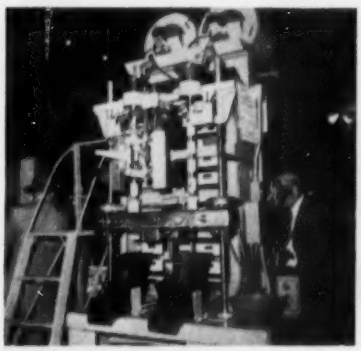
BUCKET ELEVATOR bulk-feeds product to net-weigh scales. Employing individually operated bulk and dribble feeds, product is then filled into package formed from roll stock.—Hayssen Mfg. Co., Sheboygan, Wis. (73A)

5 Pouch Formers, Fillers

ELEVATOR of this unit bulk-feeds product to battery of net-weight packaging machines that form pillow-style packages from roll material and fill them with scaled product.—Cousel Machine Co., Wallington, N. J. (73B)



LIQUID PACKETER automatically forms and fills 2 to 8 packets per cycle at up to 240 per min. It's air-operated. Matched dies eliminate leakers. Makers. Brown Bag-Filling Machine Co., Fitchburg, Mass. (73C)

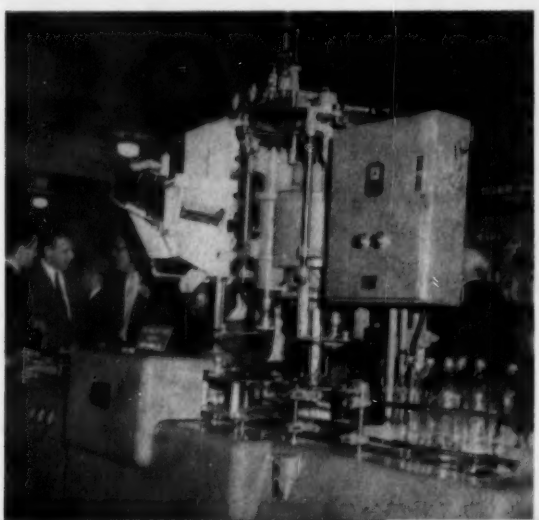


CONVEYOR LIFT delivers product to packaging machine that forms, fills and seals package from roll-fed material. Speeds: Up to 60 per min. This duplex unit is made by Stokes & Smith Co., Philadelphia. (73D)

LIQUID WRAP MACHINE forms, fills, and seals as many as 40 pouches (poly-cello) per min. Fills 3-7/16 to 5-7/16 sizes, or ¼ to 1 oz. Maker: Individually Yours, Inc., Unionville, Conn. (73E)

4 Cappers

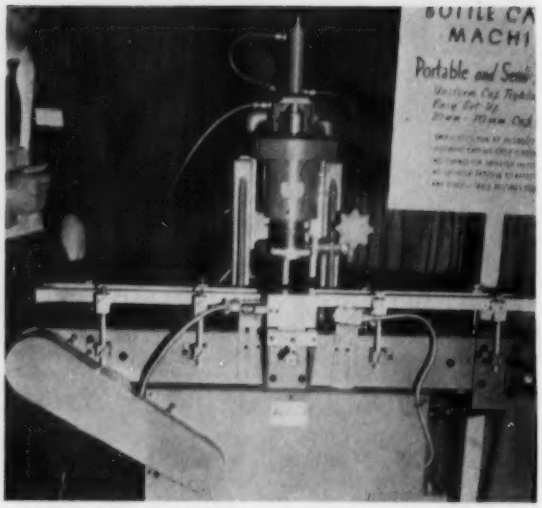
HIGH-SPEED UNIT has air chuck for trouble-free operation. Operates at rates up to 240 containers per min. Manufacturer: Pneumatic Scale Corp., Quincy, Mass. (73F)



PLASTIC CAPS are applied to glass or plastic containers on this semi-automatic machine. Rollers compensate for exibility of cap and non-rigid container.—W. H. Swanson & Co., Wilmette, Ill. (73G)

Turn for More ⟶

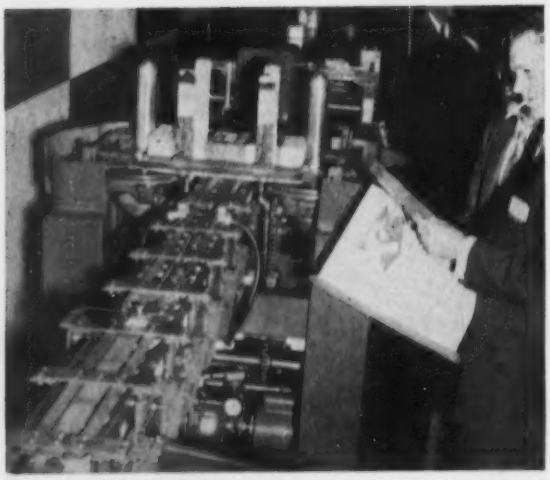
SHAKER-TOP DISKS of polyethylene are applied to bottles at 120 per min. on this new unit that attaches to standard screw capper. Also available as motorized unit. —Resina Automatic Machinery Co., Brooklyn. (74A)



PORTABLE, semi-automatic cap tightener handles 20-70-mm.-dia. caps, has 2-10 in. height adjustment, takes containers up to 7 in. dia.—Carbert Mfg. Co., Waltham, Mass. (74B)

3 Cartoning Units

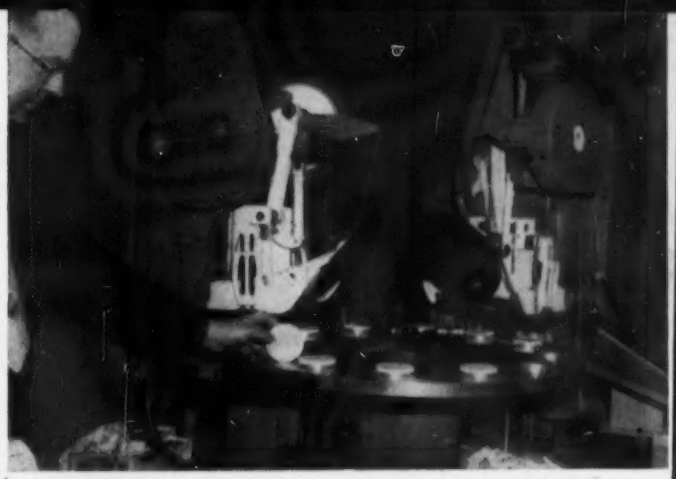
ADJUSTABLE CARTONER automatically sets up and closes cartons as products such as pies and cakes are manually inserted into them. Reportedly saves half of labor in cartoning.—Container Equipment Corp., Bloomfield, N. J. (74C)



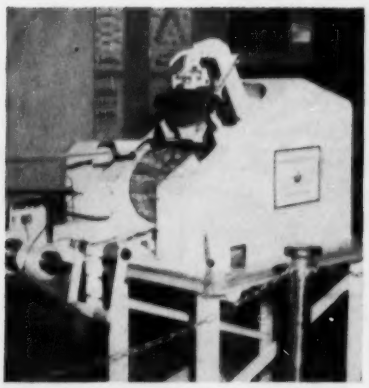
QUICK ADJUSTMENT for packaging any size can or glass container, or different size ones in same carton, at up to 900 per min. is outstanding feature of this improved machine.—Atlanta Paper Co., Atlanta. (74D)

CONSTANT-MOTION CARTONER feeds and opens cartons, inserts single or multiple loads, glues or tucks flaps of cartons (airplane or reverse tuck). Also folds and inserts leaflets.—R. A. Jones & Co., Cincinnati. (74E)

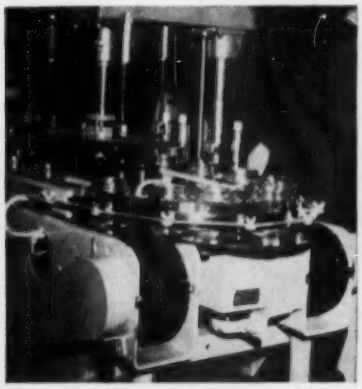
7 Coders, Imprinters



UNIT MARKS, in one or two colors, on printable polyethylene, polystyrene, paper, or metal lids or covers, at speeds to 45 per min. Manufacturer: Markem Machine Co., Keene, N. H. (75A)



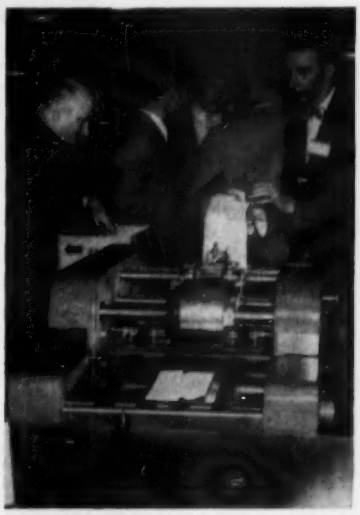
THIS CODER imprints item name, weight, ingredients, etc., on pre-printed die-cut roll, top or end labels at 125 per min. rate. Available with automatic counter.—Markem Machine Co., Keene, N. H. (75B)



IMPRINTER automatically applies code or identification mark to bottom of cans, bottles, or canisters as they travel in a production process. Manufacturer: Adolph Gottscho, Inc., Hillside, N. J. (75C)

CONVEYOR-ATTACHABLE coder prints side surfaces of set-up cartons, cases, crates, etc. Operates from built-in motor. Variable-speed mechanism synchronizes it.—Adolph Gottscho, Inc., Hillside, N. J. (75D)

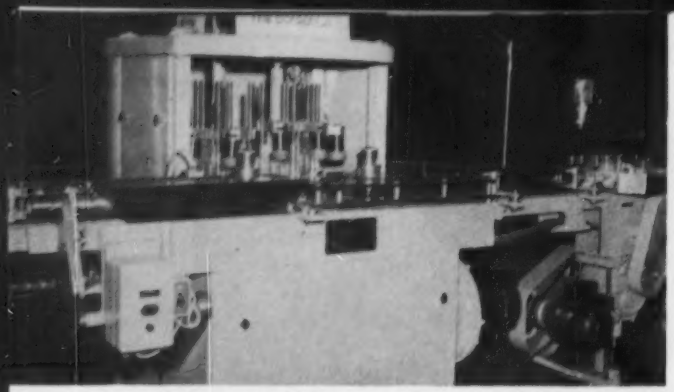
LABELS are imprinted, counted, and stacked (up to 200) automatically by this Serv-A-Label. Commodity plates are available with one or two 22-character type lines. Third line uses rubber type.—Toledo Scale Co., Toledo, Ohio. (75E)



PACKAGE IMPRINTER automatically applies dates, codes, or other marks at up to 7,500 per hr. Handles items from small envelopes to 18x18-in. cartons in thickness from 0.01 to 3/16 in.—Pitney-Bowes, Stamford, Conn. (75F)

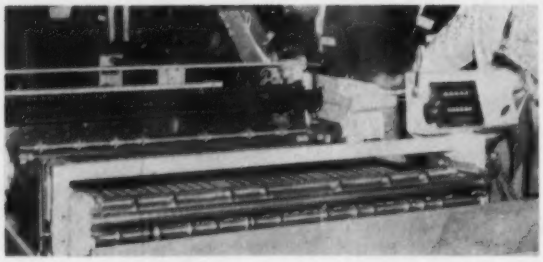
PRESSURE-SENSITIVE TAPE is imprinted and dispensed in single operation. Speed up to 110 labels/min. Can be set for re-wind, individual cutting, or cut-and-dispense operation.—Kleen-Stick Products, Chicago. (75G)

Turn for More →



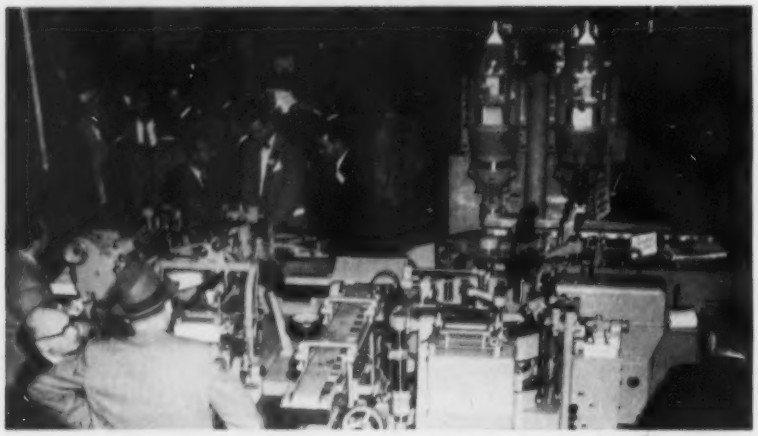
AUTOMATIC BOTTLE CLEANER has eight duplex stations, each handling two containers to double the cleaning performance at normal operating speeds. Speeds: To 140 containers per min. Adjustable to all container sizes. Entire interior of unit easily accessible for maintenance. —U. S. Bottlers Machinery Co., Chicago. (76A)

Bottle Cleaner, Bag Former



SIDE-WELD polyethylene bag-making machine runs at 40-120 bags a min. Temperature of sealing element, dwell time, and web speed can be independently changed. Bag sizes: From 2x2 to 40x40 in. Stacking-roll speed is independently adjusted to permit accurate stacking of bags. Maker: G. T. Schjeldahl Co., Northfield, Minn. (76B)

7 Baggers and Bag Opener



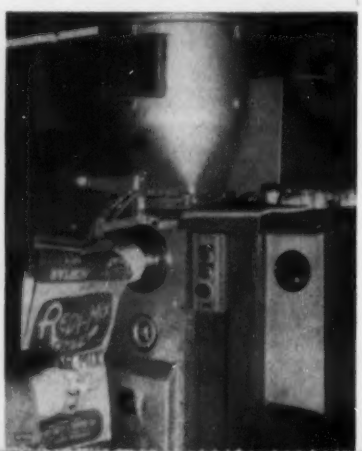
DOUBLE-BAG MACHINE packages flour or semolina in 1 or 2-lb. bags at 48-55 per min. Employs 2 auger-type fillers. Inner liner is fed from reel, outer wrapper from magazine. Vibrating packer and insert feeder are added features. Made by Fr. Hesser, Stuttgart, Germany. Displayer: Geveke & Co., New York City. (76C)

SCREW-TYPE PACKER fills valve bags with powdery, granular, or bulky materials. Its dual-spout unit provides versatility.—Fulton Bag & Cotton Mills, Atlanta. (76D)

HIGH OUTPUT and maximum precision are features of semi-automatic filler for granulated products. Variable vibrating delivery is directly controlled by scale. Bowl is opened by electronic relay. Built by Constructions Industrielles, Paris. Displayer: C. Tennant, Sons, New York City. (76E)

SPECIAL UNIT is designed for short runs or unusual packaging problems. It automatically forms bag from flat stock, then fills, seals, and cuts it from roll. Can make oval as well as rectangular packages. Operates at speeds from 30-50 per min.—Mercury Heat Sealing Equipment Co., Philadelphia. (76F)

AUGER-TYPE BAG PACKER shakes and settles as it weighs and fills. Vertical auger and blades operate simultaneously with horizontal auger to eliminate "bridging" of non-free flowing materials. Fills sizes to 100 lb. at up to 15 tons per hr.—E. D. Coddington Mfg. Co., Milwaukee. (76G)



Dramatic proof that **ACRONIZED*** keeps chicken fresh longer!

***ACRONIZED...an exclusive development of American Cyanamid Company...is the antibiotic cleared by the Government for use in maintaining poultry freshness.**

This chart of actual tests on both Acronized and untreated chickens shows why Acronized has been adopted so rapidly by poultry plants from coast to coast for retarding spoilage in fresh-killed birds.

As you can see in the comparison, at the end of 14 days under normal refrigeration, for every microorganism found on an Acronized bird, nearly 33,000 were present on each untreated bird!

By retarding spoilage Acronized now opens the door to *tray-packing*.

For the first time, you can package either whole or cut-up poultry without risking the "incubator effect" that speeds spoilage.

And the Acronized process is simple. You merely add Acronized solution to the standard chill bath for fresh-killed poultry—and the growth of spoilage bacteria is slowed at once.

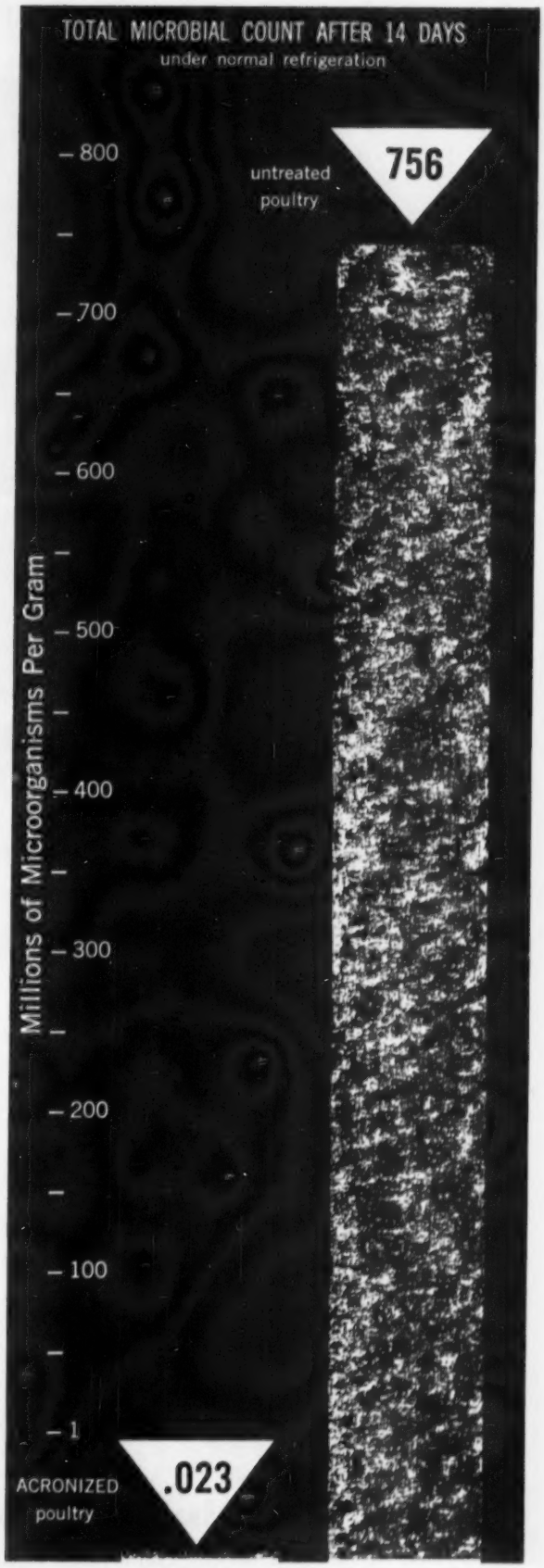
Acronized maintains the taste, color, and country-freshness of the fresh-killed bird longer than ever before possible. Your top quality is delivered into the consumer's kitchen.

Write today for details on how your plant may qualify for the Acronized franchise.

AMERICAN CYANAMID COMPANY

Food Industry Department • 30 Rockefeller Plaza • New York 20, N. Y.

All **ACRONIZED** poultry—bulk or tray-packed—carries this seal...



For more data, circle this page number on card at back →

Simple Arithmetic...
Type 302, Sheet Base Price 44.50 cents per lb.
Type 430, Sheet Base Price -34.50 cents per lb.
Saving 10.00 cents per lb.
in Stainless SHEET Costs!

Now You Can SAVE $200 Per Ton!

Many designers and fabricators who are currently using Type 302 stainless can, in numerous applications, specify Type 430 straight chromium stainless and take advantage of the 10 cents per pound difference in base price. Some of our customers are already saving more than $200 per ton using our 430 MicroRold stainless sheet.

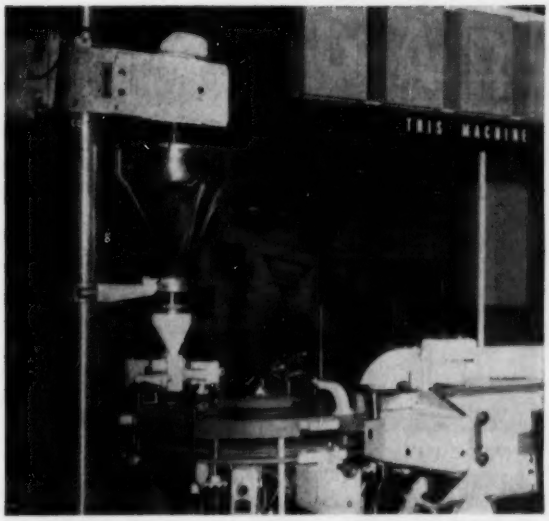
The steel industry estimates that 50% of all stainless sheet applications could satisfactorily employ Type 430, the least expensive of all stainless grades, as an economical and practical material. When properly applied, Type 430 has all the desirable qualities of beauty, corrosion resistance, strength, long life and low maintenance that no other material, except stainless, can offer.

We are currently producing our MicroRold Type 430 sheets in thicknesses .005" to .109" with 2B or 2D finishes; and in thicknesses .010" to .109" in No. 3, 4 and 7 finishes.

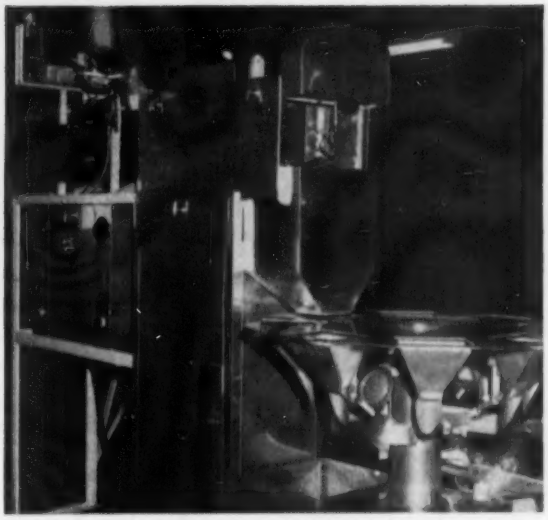
Send for Your copy, "Care and Use of 430 MicroRold Stainless Steel"

Washington Steel *Corporation*

5-W WOODLAND AVENUE, WASHINGTON, PA.

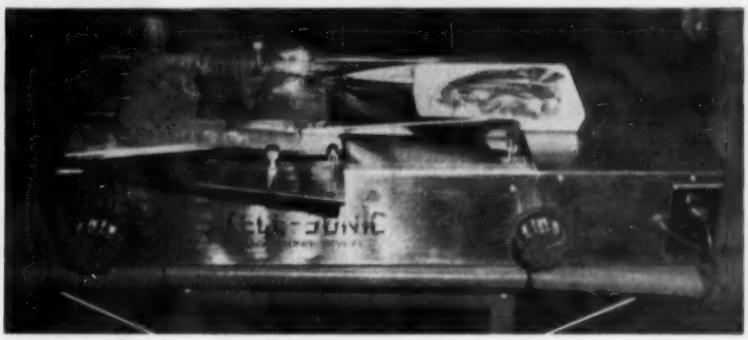


PACKING MACHINE called Hermic X handles Hermetet cartons from 2x1-1/8x3-3/16 to 3-3/4x2-3/16x6-5/16 in. Carton size change can be made in 15 to 20 min. Liner in carton doesn't collapse during normal filling. Carton can be heat-sealed when using proper liner. Displayer: Gardner Board & Carton Co., Middletown, Ohio. (79A)



WEIGH-BAGGER of new design employs double dumping weigh bucket on high precision scale lever fed by dual vibrators. Product discharges into bags supported by stainless indexing turret with agitating spouts. Weighs from 1 oz. to 5 lbs. at up to 50 per min.—Walter J. Reynolds Co., Portland, Ore. (79B)

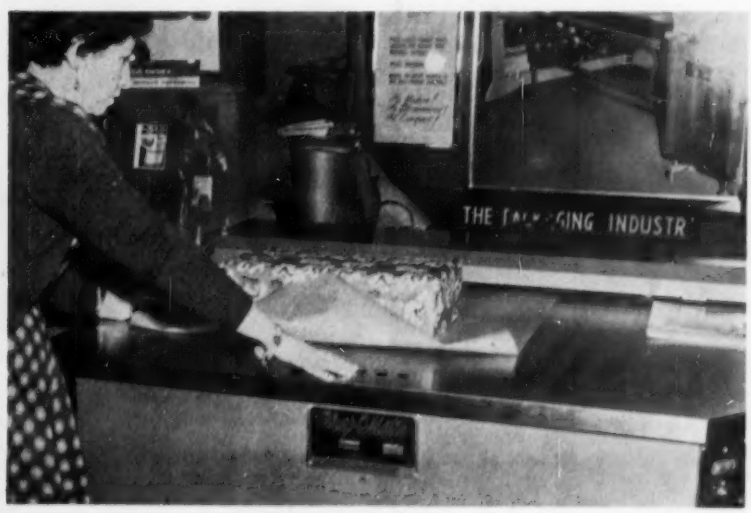
AIR-OPERATED BAG OPENER of sanitary design speeds packaging of meat and bakery items. Has adjustable guide for inserting product. Also heat sealer.—Tele-Sonic Pkg. Corp., New York City. (79C)



4 Wrappers

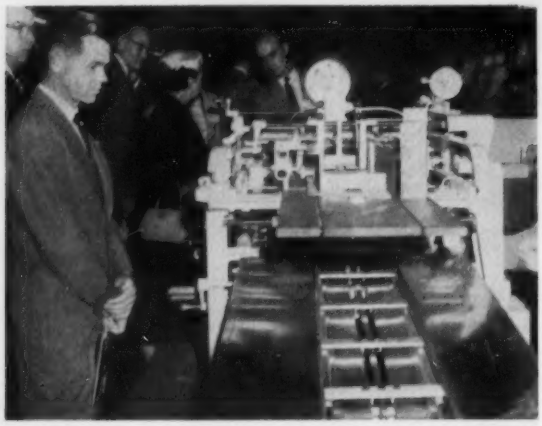
WRAPPING of many sizes and shapes of meats, poultry, etc., in a choice of folds, and with a variety of materials, is accomplished by this Speed-Wrap unit.—National Equipment Corp., New York City. (79D)

SPEEDY HAND WRAPPING is assured by unit that automatically cuts and feeds desired-size sheets of cello, wrapping paper, or single-faced corrugated board. Four-button control enables instant size changes.—Rosenthal Mfg. Co., Chicago. (79E)



Turn for More →

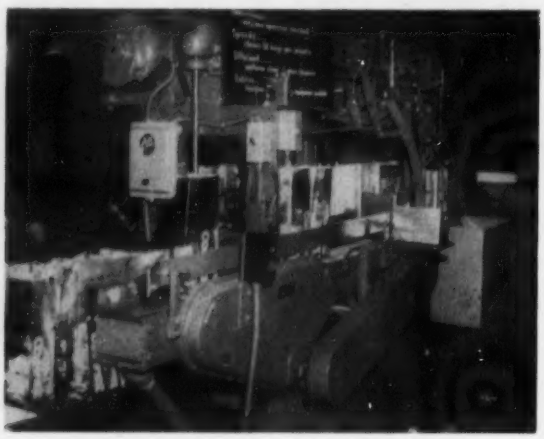
UNIT WRAPPER with hand-feed conveyor runs at over 100-per-min. rates. Called ideal for packaging flat-top food items. Conveyor has pusher bars. Manufacturer: Wrap-Ade Machine Co., Belleville, N. J. (80A)



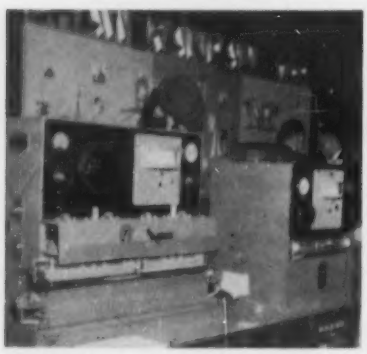
WRAPPER has cardboard folder, feeder, coder, thermoplastic roll-type labeler, underfold attachment. Handles products in cartons and trays.—Oliver Mach'y Co., Grand Rapids, Mich. (80B)

5 Types of Sealers

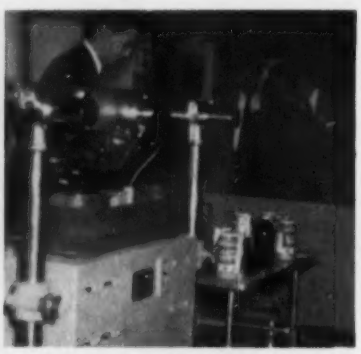
ROTARY BAG SEALER is equipped with ink printer, hole puncher, and "tear here" slitter. Operations are carried out while sealing bags. Maker: Pack-Rite Machines, Milwaukee. (80C)



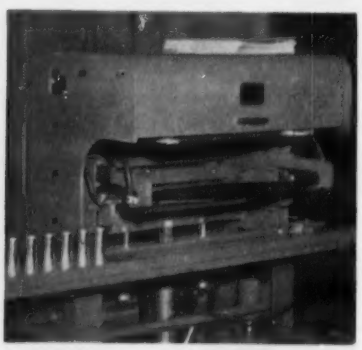
BAG-CLOSING MACHINE operates at 35-per-min. rate, using steel tie or glue closure. Attachments available to heat seal and date bags. Displayer: Continental Can Co., Shellmar-Betner Div., Mt. Vernon, Ohio. (80D)



HEAT SEALER is designed for laboratory testing and quality-control work on wide variety of films, including Mylar. Includes special temperature and dwell-time controls.—Packaging Ind., Montclair, N. J. (80E)

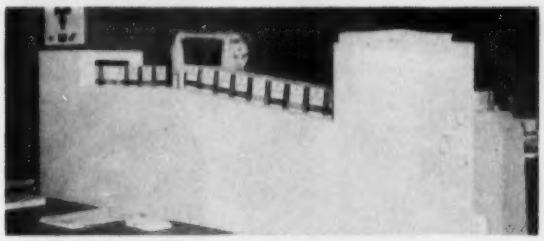


OUTSERT APPLICATOR performs on 220 cylindrical containers per min. Compact in-line machine tapes outfold leaflet to exterior of container at predetermined point.—The Pfaudler Co., Rochester, N. Y. (80F)



POLYETHYLENE TUBES and bottles are sealed in units of 10 at high speed on this Bank-Seal machine. Handles containers of 11-60 mm. dia., 2-11 in. high.—Carbert Mfg. Co., Waltham, Mass. (80G)

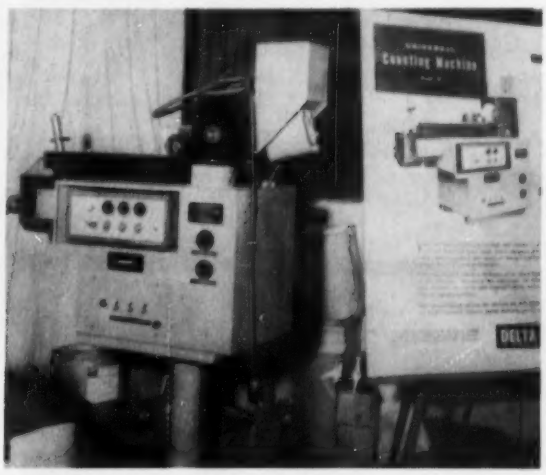
4 Counters



ELECTRONIC COUNTER totalizes conveyorized items at up to 100 units per sec., with direct readout of data. Photocell and exciter lamp are operated directly from the counter. Manufacturer: Post Machinery Co., Beverly, Mass. (81A)

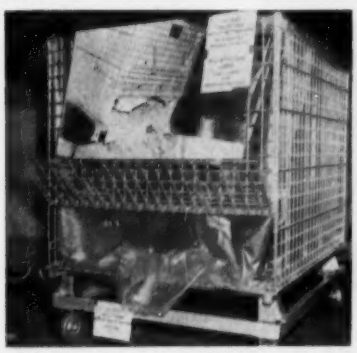
MULTI-CHANNEL INPUT for photoelectric counters permits counting of five lines of objects at same time. Unit indicates total even though all beams are interrupted at exactly same time.—Post Machinery Co., Beverly, Mass. (81B)

UP TO 200,000 ITEMS hourly (as small candies) is speed of this feeding, orienting, and counting machine. Any count from 1 up is easily obtained by setting dials on electronic instrument. Maker: U. S. Engineering Co., New York City. (81C)



HIGH-SPEED PRECISION COUNTER can be changed over to handle different items without additional guides or other equipment. Machine sorts, counts, and divides product into pre-set quantities.—Delta Engineering Co., Boston. (81D)

3 Material Handlers



THIS UNIT, called the Palletainer, has polyethylene liner with 8-in.-dia. discharge. It's portable equipment for bulk handling of granular materials. Capacity: 4,000 lb.—Union Steel Products Co., Albion, Mich. (81E)

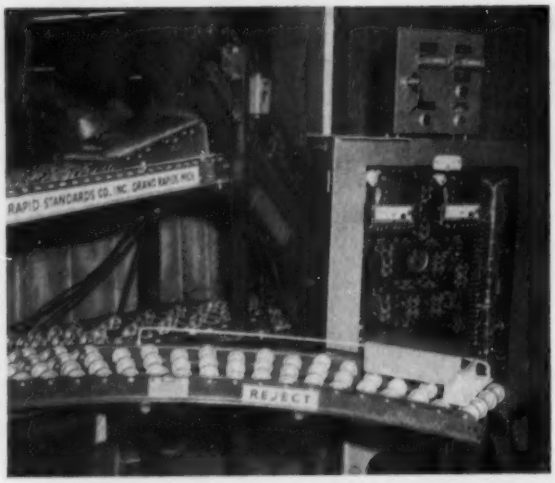
THESE BULK CONTAINERS are designed to replace bags, permit faster boxcar loading, simplify packaging operation, stack easier, and facilitate the taking of inventory. Displayer: Gaylord Container Corp., St. Louis. (81F)

BULK MATERIALS are moved at carefully controlled rates from trickle to 4 tons per hr. by this new vibrating feeder. No rectified power is needed. Special-shape feeder trays supplied.—Eriez Mfg. Co., Erie, Pa. (81G)

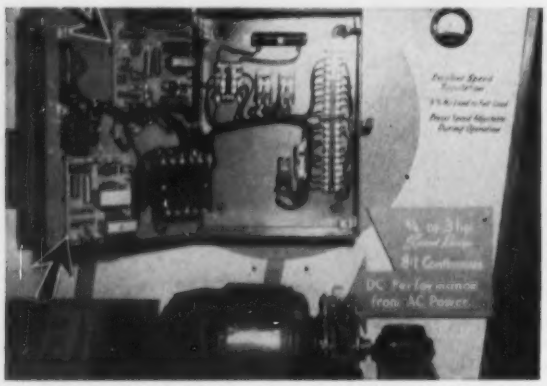
Turn for More →

Caser, Miscellaneous Units

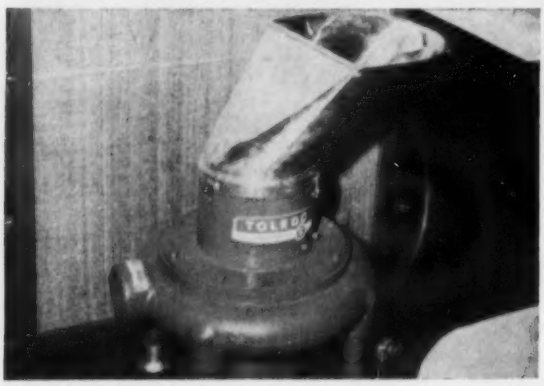
PACKAGE CASER conveys and aligns packages, elevates and tiers, loads cases, and lowers them to discharge belt, ready for sealing. Speed: To 240 packages per min. —Food Machinery & Chem. Corp., San Jose, Calif. (82A)



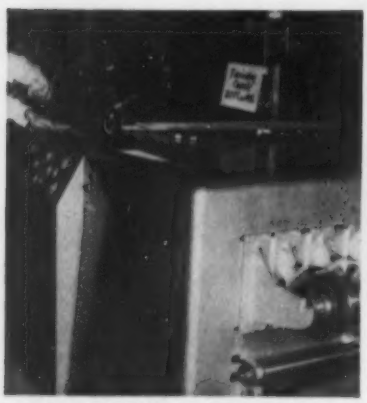
CLASSIFIER automatically checks weight of case to make sure it contains predetermined number of units, rejects underweight ones.—Toledo Scale Co., Toledo, Ohio. (82B)



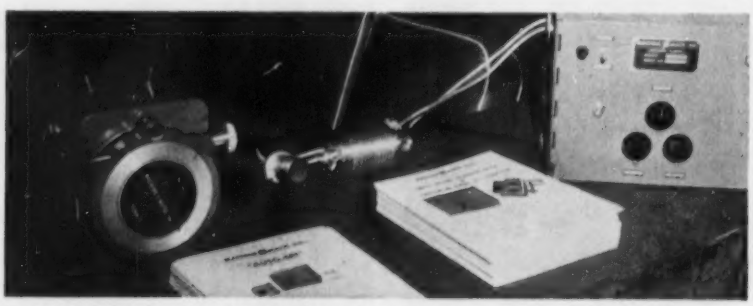
EASILY-REPLACEABLE printed circuit units (arrows) are used in controlling mechanism for adjustable-speed drive that employs electron tubes to convert a.c. power to d.c.—General Electric, Schenectady, N. Y. (82C)



NEW WASTE DISPOSER has 10-in.-dia grinding chamber. Combines fast multiple shredding and cutting, high-speed disk rotation, and strong hydraulic action for top capacity. —Toledo Scale Co., Toledo, Ohio. (82D)



SHEET PLASTIC is formed into rigid containers by this vac-type machine. And they're delivered in continuous strip.—Comet Industries, Franklin Park, Ill. (82E)



AUTO-SETTING UNIT is for eliminating costly setup time, material waste, and errors in imprinting, bagging, wrapping, etc., where repeat lengths are determined by trial and error. Setting is obtained by adjustment of vari-speed drive.—Machine O'Matic, Chicago. (82F)

For More Details, Circle Key Numbers On Readers' Service Card (Last Page)

Carlyle quarry tile colors . . .

250 Bluegrass Green—newest quarry color
120 Mecca—dk. chocolate brown
140 Greytone—med. gray, flashed
130 Cinnamon—mellow brown
150 Egyptian—rich flashed buff
110 Navajo—deep warm red
200 Taupe—blended gray, flashed
175 Pompeian—light buff
170 Russet—vivid red-brown
240 Suntan—buff, golden tone
160 Oriental—dark red, flashed

For floors that can take it . . . everywhere . . .

No. 120 Mecca

Sizes: (with trim shapes): ½" thick—2¾" x 2¾" to 8" x 3¾". Available also where desired: ¾" thick—2¾" x 2¾" to 9" x 9". Also available with abrasive surface.

Carlyle Quarry Tile . . . . . the widest line of quarry tile

Colorful floors of Carlyle Quarry Tile will remain fadeproof, fireproof and 100% serviceable for the life of your building. Scuffs, stains, grease, acids wash away — harmlessly, economically. Yet, the cost of Carlyle Quarry Tile floor is most reasonable, compared with any other floor material.

Whether you are planning a new building or modernizing, your architect, builder and tile contractor will recommend Carlyle Quarry Tile.

Most colors and sizes are readily available. Ask your tile contractor or Mosaic representative for details. For your Carlyle Quarry Tile Catalog, write Dept. 25-3, The Mosaic Tile Company, Zanesville, Ohio.

A product of THE MOSAIC® TILE COMPANY

America's largest manufacturer of ceramic floor and wall tile

Member—Tile Council of America and The Producers' Council, Inc. Over 5000 Tile Contractors to serve you.

Showrooms, Warehouses and Factories from Coast to Coast . . . **WAREHOUSES & SHOWROOMS:** Atlanta, Baltimore, Boston, Chicago, Corona, Calif., Dallas, Denver, Detroit, El Segundo, Calif., Fresno, Greensboro, Hartford, Hempstead, L. I., N. Y., Hollywood, Ironton, Little Rock, Matawan, Miami, Minneapolis, New Orleans, North Hollywood, Philadelphia, Portland, Rosemead, Calif., Salt Lake City, San Diego, San Francisco, Seattle, Tampa, Washington, D. C., Zanesville. **SHOWROOMS:** Milwaukee, New York. **REPRESENTATIVES:** Birmingham, Buffalo, Cincinnati, Kansas City, Oklahoma City, Pittsburgh. **FACTORIES:** Zanesville & Ironton, Ohio, Matawan, N. J., Little Rock, Ark., Jackson, Miss., Corona & El Segundo, Calif.

Shuttleworth

can handling equipment proves ability to make big labor savings.

developed by canners for canners

UNSCRAMBLER

(A) As part of a complete system, the Shuttleworth Can Unscrambler receives cans from the Crate Unloader or Conveyor. Smoothly and efficiently delivers a steady feed to labeler.

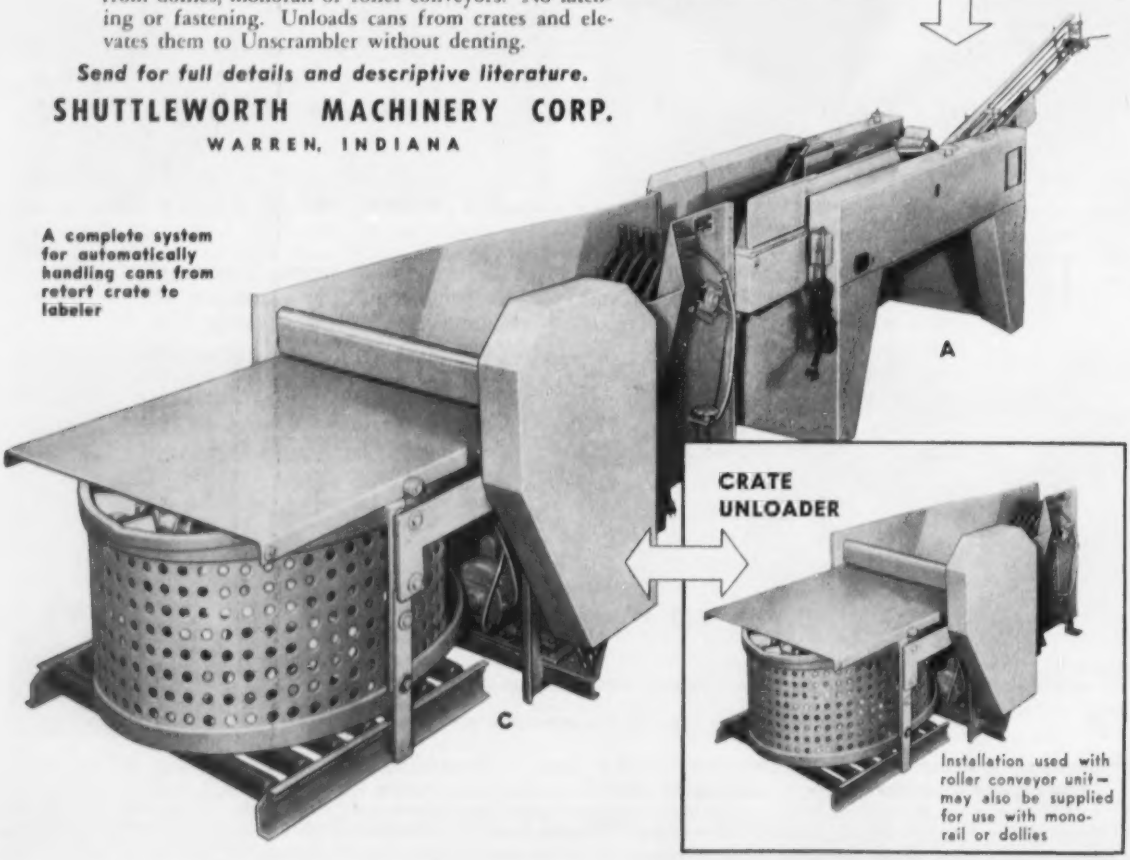
(B) As a portable unit, this machine may be quickly wheeled to the labeler for the feeding of bright cans from cases.
Either method results in a rapid and steady supply to the labeler, with gentle handling of cans. Requires no operator and in most installations reduces labeling costs by 50% or more.

CRATE UNLOADER

(C) For fast, gentle handling of wet or dry cans from the retort, the Shuttleworth Crate Unloader saves thousands of man hours per year. It receives crates from dollies, monorail or roller conveyors. No latching or fastening. Unloads cans from crates and elevates them to Unscrambler without denting.

Send for full details and descriptive literature.

SHUTTLEWORTH MACHINERY CORP.
WARREN, INDIANA


UNSCRAMBLER
B
Installation for the feeding of bright cans to labeler
A
CRATE UNLOADER
C
Installation used with roller conveyor unit—may also be supplied for use with monorail or dollies

A complete system for automatically handling cans from retort crate to labeler

Propose Irradiation Of Foods in Power Plants

Army experts see cost advantages in dual-purpose nuclear reactors.
Discuss progress in irradiation and take optimistic view.
Challenge food industry to help speed development

FE WASHINGTON BUREAU

Washington's food association representatives turned out in force for a full evening's briefing April 17 on what may be the next major development to win a place in the industry—preservation of food by nuclear irradiation.

The briefing was provided by five Army experts, participating in a panel discussion arranged by the Quartermaster General's Office and the Commerce Department's Business and Defense Services Administration. It coincided with the second annual atomic trade exhibit.

Discussion ranged over a broad field. For the food industry, there were these significant items:

Proposes Power-Plant Radiation

The North American-Nebraska power group recently has approached the Army with a proposal to insert design modifications in their power reactor to provide irradiation services. North American-Nebraska now is negotiating with the Atomic Energy Commission, looking toward construction of a sodium graphite reactor capable of generating 75,000 kw. of electricity.

► **Depending on their outcome, these talks could result in construction of the nation's first commercial-scale reactor equipped for treating food with gamma rays.**

The power group's interest in approaching the Army was explained at the symposium by Lt. Col. Truman F. Cook, radiation engineer with the Office of the Chief of Research & Development, Department of the Army.

"The development of atomic power currently is confronted with the problem of high costs," said Col. Cook. "The irradiation processing of food may provide ancillary income through the proper use of gamma rays, which at present are byproduct waste. This could decrease the price gap between nuclear and conventional sources of electricity."

Col. Cook, and other panelists, made these other points in a rundown on the economics of widespread adoption by the food industry of ionizing radiation to preserve food against insect contamination and spoilage:

Cost Estimates Presented

Economic feasibility is still a matter of conjecture. Best present estimates show these costs: To stop sprouting in potatoes or onions, 0.03c., ±0.02c. a pound; to kill insects in grain, 0.06c., ±0.02c. a pound; to sterilize meat—so packaged that it can be stored at room temperatures for months—3c. a pound, with a possible range of 1 to 5c.

"These costs will drop and the range rapidly reduce," the Colonel indicated, "as we develop better concepts for producing commercially acceptable radiation sources."

► **The panelists were uniformly optimistic about the prospect that the "conservative food industry" would furnish a wide range of irradiated foods within a decade.**

Radiation sources may be of two kinds: Reactors using nuclear sources that produce gamma rays, or electron generators that produce beams of electrons (beta rays). Already, Swift & Co. has indicated that in three or four years it may be marketing radiation-treated packaged meats. Army panelists said they assume that Swift would use electron radiation.

"The electron generator industry," said Col. Cook, "appears capable of constructing any number of machines at the desired operating ratings if orders were placed today." Among their advantages are portability, low operating cost, high efficiency, and the fact they do not use fissionable material. But electron generators are limited to treating grains and foods processed in slabs, like bacon, steaks, fish fillets, and cheese. They are likely to find their best use on foods which have a seasonal or transient processing cycle and relatively low volume at any one location.

Radiator to Make Steam

► **"For gamma radiation," Col. Cook declared, "it appears that reactors are the most feasible. It can be shown that specially designed reactors can be constructed to irradiate food in a profitable venture, even if the heat is thrown away. The Btu.'s need not be wasted, however. They can be used for space heating and the generation of low-pressure steam, both required in food processing plants.**

"Reactors for the industry appear to be most promising for the irradiation of those foods which are brought to central locations for processing in volume, such as meat, poultry, fish, and possibly grain—or for large items, such as roasts or quarters."

Others besides the North American-Nebraska group are offering power reactors whose overall economics could be improved if the design provided for the radiation of food and other materials. "It is our opinion," Col. Cook reported, "that multi-purpose reactors should be built to bring about an earlier realization of nuclear electricity competitively with conventional electricity, and at the same time give rise to a brand new and desirable industry —food irradiation."

► **Col. William D. Jackson, Chief of Research & Development, Quartermaster General's Office, said the time has come for the food processing industry to team up with the Army and other government agencies in a broadened effort to bring about this day.** (*Turn to page 96*)

Dairymen's conference targets—

Concentrated Milk, Frozen

Tips come thick and fast in key evaluations of significant new products and processes

SPOTLIGHT ON CONCENTRATED MILK

Cited first off was the keen interest in the development of a concentrated milk affording reasonably-long keeping properties and palatability comparable to fresh fluid milk.

Here, H. E. Calbert, U. of Wisconsin, pointed out that changes in consumer buying habits have particularly invited the new efforts to establish a concentrated product. Special stress was laid on the following seven factors—

- **Every-day home deliveries have become a thing of the past.**
- **Every-other-day deliveries are still expensive market-wise.**
- **More milk is being bought through retail stories, where it is cheaper than when taken by home delivery.**
- **Local, small-town dairies are passing out of the picture.**
- **Good markets for fresh fluid milk from the Upper Midwest's dairy belt are looming up in relatively distant parts of the U.S.**
- **Time appears ripe for the consumer to make once-a-week purchases.**
- **Transportation and refrigeration won't drop.**

A check of these points makes it evident that introduction of an acceptable 3-to-1 fresh concentrated milk—evaporated to one-third original volume for later reconstitution on the basis of 1 part milk to 2 parts water—would go far in helping dairies expand their markets.

Concentrated milk was tried out back in 1930. But it failed on three major counts: (1) the public was not yet conditioned to concentrates, (2) the product was not of top quality and keeping properties, and (3) there was not enough promotion behind it.

- However, fresh concentrated milk is now being successfully test-marketed in Ames, Iowa, and San Francisco, where it represents about 25% of the milk consumed.

The stage has been reached, went on Mr. Calbert, where commercial production of fresh concentraed milk is feasible. Primarily, this triumph has been achieved by selecting top quality milk and concentrating it to one-third its original volume, with use of tailored techniques and special equipment (like ultra-high temperature, short-time heat-exchangers).

FE STAFF ARTICLE

Research is also continuing at the U. of Wisconsin on frozen concentrated and sterile concentrated milks.

Big problems with the frozen concentrates are flavor and stability. But progress is cited, and it is hoped these posers will be licked before long.

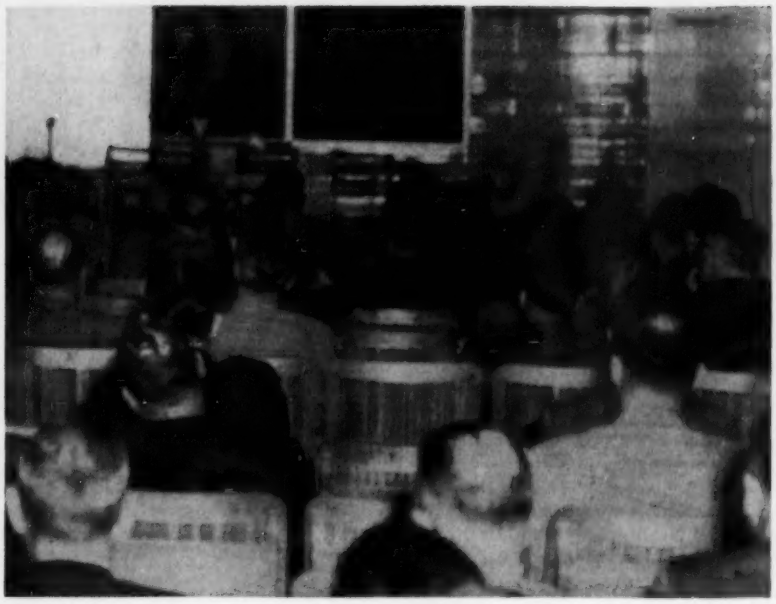
Sterile (aseptically canned) concentrated (3-1) milk is as acceptable as fresh whole milk, and it can be kept 6 months without refrigeration.

Manufacturing Techniques

Key to the making of fresh concentrated milk having improved flavor and keeping quality has been the technique of increasing the heat treatment, according to A. M. Swanson, U. of Wisconsin.

When canned and stored, the 3-1 concentrate held up satisfactorily for 4 weeks at 55 F. and 6 weeks at 45 F.

Here's how the university workers are producing an acceptable fresh concentrated milk: (1) Pre-heating to 170 F. in a plate- or tubular-type heat-exchanger; (2) homogenizing under a pressure of 2,100 psi.; (3) heat-treating to 265-275 F. in a high-temperature, short-time heat-exchanger; (4) cooling to 125 F.; (5) concentrating at 110 F.



PROCESSORS LEAN FORWARD for every word in "hot-subject" session at U. of Wisconsin, Madison.

Desserts, Special Problems

to one-third original volume in an evaporating pan; (6) standardizing; (7) finishing off heat treatment at 220-225 F. for 4 sec. in an ultra-high temperature, short-time heat-exchanger; (8) cooling to 50 F.; and (9) aseptically canning.

Bacteria Important

Satisfactory keeping quality of the fresh concentrated milk is related to bacteria content, emphasized W. C. Frazier, U. of Wisconsin.

The processor going into the production must use a milk with a low bacteria content, especially one with the least number of heat-resistant spore formers (bacillus and clostridium).

Then he must virtually kill all these spore formers, avoiding re-contamination after the main heat treatment. That's not all. He must aseptically fill the product into sterile containers, and properly handle it to delay growth of bacteria.

Big trouble-causers, he stressed, were those heat-resistant spores that can get into the raw milk through soil, silage, and bedding.

Present production system is a closed one, set up to sterilize the product from end-to-end. Through use of adequate filters, airborne spores cannot be dragged into the system upon releasing vacuum.

Critical time, in respect to re-contamination possibility, is after the first heat treatment.

Temporary warming of the product is to be considered. Holding the fresh concentrate 1 day at 70 F. resulted in no adverse change when it was put back into cold storage for 2 weeks. But keeping it 2 days at 70 F. resulted in spoilage within 2 weeks.

A preliminary survey revealed consumer acceptance for the fresh concentrate, according to H. W. Halvorson, U. of Wisconsin. Of 474 families surveyed in Madison, 9.7% liked it better and 65.9% saw no difference, whereas only 24.4% rated it below fresh milk.

Frozen-Concentrated Hurdles

Three problems have stymied the production of frozen concentrated milk, reported W. C. Winder, U. of Wisconsin.

▶ **They are: (1) Break-up of fat emulsion, (2) oxidized flavor change, and (3) "age-thickening" (also known as gelation or protein-instability) during low-temperature storage.**

The fat break-up problem seems to be about overcome through adequate homogenizing techniques. Also, there is progress toward curbing the storage-oxidized flavor.

What researchers have found is that heat treatment produces anti-oxidants in milk that curb the oxidized flavor. Produced are certain sulfur compounds that control this oxidized flavor. However, the trouble with this extra heat-treatment is that the milk takes on a cooked flavor.

Inevitably, antioxidants will be added. But they are less effective in concentrated than in fresh milk. And the same goes for certain enzyme extracts.

Age-thickening, or gelation, is the biggest of the stumbling blocks. Difficulty is that with reconstitution (and after only 2 weeks of storage), a curd drops and whey rises.

Here are some of today's findings:

1. Storage temperature influences gelation or stability. Concentrate holds up better and longer with lower storage temperatures. At −15 to −20 F., a 3-1 frozen concentrate kept 5 to 6 months without gelling or age-thickening. Big problem is going to be satisfactory keeping of the frozen concentrate in the home refrigerator.

2. Rate of freezing the concentrate has no effect upon its stability.

3. Salt balance—ionic and anionic—affects stability. Age-thickening can be prolonged by removing one-third of the milk's calcium. But nutritionists would decry this step.

4. Removal of one-third to one-half

of the lactose results in better stability. Here, the disaccharide sugar, lactose, is chemically split into its simpler monosaccharides.

5. Drawing a vacuum from a canned concentrate and then gassing it with nitrogen under a pressure of 20 psi. extended shelf-life an additional 2 weeks.

6. Adding a natural milk-protective colloid—sodium caseinate—helped to stabilize protein, prolong shelf-life.

7. Blocking of the gelation (or agglomeration of protein molecules to form a gel) showed an extension of 10-F. storage life from 2 weeks to 3 months. The manner of blocking was not disclosed.

PROGRESS ON FROZEN DESSERTS

Big problems in making low-fat frozen desserts are machinery limitations and mix formulas, reported W. C. Winder in another paper.

Low "draw off" temperatures (18-21 F.) limit overruns to 30-55%, whereas higher (70-80%) are consumer-preferred.

Mix formulations vary: Fat, 3-8%; serum solids, 12-13% (Wisconsin minimum is 12%); sugar, 13-16%; stabilizer, 0.3-0.4%; and emulsifier, 0.10-0.15%.

A single formula—an outcome of 38 tested ones—was developed for making soft-dispensed and packaged, hardened products. This formula calls for 6% fat, 12% serum solids, 13% sugar, 8% corn syrup solids, 0.4% stabilizer, and 0.1% emulsifier (monodiglyceride).

The product dispenses well at 18-19 F. in soft form. And there was no "sandiness" (due to high lactose content in serum solids) during 2 months of holding of the hardened product in dealers' cabinets.

Specifics on Ices, Sherberts

"Door-opener" in gaining new customers are ices and sherbets, according to W. J. Caulfield, Iowa State College.

But to win the new customers, these products must have high quality flavors (preferably fruits), eye-appeal, smooth texture, controlled overrun (30%), retained firmness, and neat packaging. Overfreezing results in a "crumbly" sherbet.

Ices might contain 12% corn syrup solids, 24% sugar, and 0.45% stabilizer. Sherbets might have, for example, 2% butterfat, 3.7% serum solids, 9.6% corn syrup solids, 22% sugar, and 0.4% stabilizer.

Here are excellent fresh fruit-type sherbets (on 100-lb. basis), with the costs that were cited.

Lemon—9.6 lb. lemon puree (5:1), 90.4 lb. sherbet mix, 20 ml. lemon shade color (1 oz. tartrazine per qt. solution), and 5.4 oz. citric acid (50% solution). Cost per 100 lb.: $7.64.

Lime—9.5 lb. lime puree (3:1), 90.5 lb. sherbet mix, 28.6 ml. lime color (95 ml. of tartrazine plus 5 ml. of blue No. 1, each solution containing 1 oz. of dye per qt.), and 9½ oz. of citric acid (50% solution). Cost per 100 lb.: $7.30.

Orange—10 lb. orange puree (3:1), 90 lb. sherbet mix, 44 ml. color (300 ml. of orange No. 1 plus 100 ml. of tartrazine), and 10.64 oz. citric acid (50%). Cost: $7.40.

Pineapple—23 lb. crushed pineapple (semi-sweet), 77 lb. sherbet mix, 2.19 lb. lemon puree, 3.3 ml. egg-shade color, and 7.4 oz. citric acid (50%). Cost: $10.17.

Raspberry—14.6 lb. red raspberry puree (4:1), 85.4 lb. sherbet mix, 12.2 oz. citric acid (50%), and 110 ml. raspberry-shade color (1 oz. of amaranth red No. 1 per qt.). Cost: $10.17.

Values of Corn Syrup

For ice cream, regular corn syrup is recommended over Hi-Conversion corn syrup or corn sugar. Following are the reasons as pointed out by W. J. Caulfield.

1. It has low sweetening value—2 lb. replace 1 lb. of cane or beet sugar without increasing sweetness of mix.

2. It contains a relatively high percentage of dextrins and higher sugars that combine with water and improve the body and texture of ice cream.

3. It has less effect on freezing point of mix than Hi-Conversion corn syrup or corn sugar. Its use, therefore, will not result in a product that is difficult to freeze or maintain in firm condition in dealers' cabinets.

In using liquid corn syrup, it is important to avoid over-heating (above 110 F.) and also storing at such temperatures as 100 F. for prolonged periods.

Chief advantage of corn syrup is that it permits production of higher-solids ice cream mixes at minimum cost. Without it, total solids content of the mixes is curtailed because each solid constituent is self-limiting. Through use of corn syrup solids, total solids of mix may be increased to 40% or more, and at a minimum cost.

Potential advantages: Improved texture; more resistant, "chewy" type of body; and higher overrun without impairing body and texture.

Ice cream mixes containing corn syrup solids will require more vanilla flavoring than those containing only cane or beet sugar. Exact amount should be determined in each individual plant.

Test data indicate that 4-5% corn syrup in ice cream with 13 and 12% sucrose may be expected to:

- Have no significant effect on acidity, protein stability, or whipping ability of mix.
- Slightly increase viscosity of mix.
- Produce a flavor of ice cream comparable to (but no better than) that of one containing only sucrose.
- Score 0.5 points better than comparable ice cream containing only sucrose, on a body and texture basis.
- Avoid impairment of the melting quality of the ice cream.

POINTERS ON SPECIAL PROBLEMS

Attainment of greater home-keeping quality of regular fluid milks, ways to curb degrading bacteria, tips on checking culture and starter failures, and control of fat losses were highlighted topics of other talks.

Ultra HTST for Milk

Seen feasible, through use of ultra-high temperature short-time pasteurization, employing a new heat exchanger, is once-a-week delivery of fluid milk in large containers, such as 3-gal units.

So declared Jack Mistarz, Chicago Stainless Equipment Corp., Chicago, who pointed out how 220 deg. F., or higher, temperatures in exposures of 3-4 sec. bring very high kills of bacteria and accordingly might well solve the problem of extending keeping quality of milks as long as 3 weeks in home refrigerators.

Versus Psychrophiles

Ubiquitous, cold-loving psychrophiles are trouble-making bacteria that dairymen must watch very carefully, warned E. M. Foster, U. of Wisconsin.

They don't grow fast under 35-45 deg. F. dairy refrigeration. But they do steadily multiply to higher-than-normal numbers, to adversely affect dairy foods.

With too-long-held milk picked up by tank truck—and more so with milk pasteurized by not-too-sterile equipment, they: Increase bacteria plate-count, cause mild off-flavors (bitter and rancid), produce gross changes

(*Turn to page 160*)

HELL ON WHEELS

Wet, Oily Processing Plant Floors Are Rough On Ordinary Hand Truck Wheels . . . But Not On Neotreads

Stainless steel hand truck bodies are proof against almost all conditions found in packing and processing plants but, until the development of the Neotread Wheel, the maintenance cost of hand trucks was excessively high.

NEOTREAD WHEELS ARE STANDARD ON ALL ST. JOHN ROLLING EQUIPMENT

St. John stainless steel hand trucks have sloshed around on floors covered with brine, fats, water and other corrosive substances for many years—their Neotread Wheels, some of them in daily operation for 10 years or more, show virtually no signs of use—a record not even remotely approached by other wheels.

When specifying new or replacement rolling equipment for your plant, be sure to get the St. John low maintenance cost facts. Write for them today.

Neotread Wheels and Casters for replacement of your present equipment are available in a complete range of sizes from 4 to 20 inches in diameter.
Ask for Neotread Bulletin D.

FOOD PROCESSING EQUIPMENT QUALITY ST. JOHN CHICAGO BUILT TO LAST

"Famous for Stainless"

ST. JOHN & CO.

5800 SO. DAMEN AVE. CHICAGO 36, ILLINOIS

To obtain UNIFORM product quality

specify a Proctor DRYING RANGE

NEWEST PRE-FORMING TECHNIQUES
FASTER, MORE UNIFORM DRYING
MORE PROFITABLE OPERATION
FLEXIBILITY OF OPERATION

PROCTOR CONTINUOUS CONVEYOR DRYER AT NATIONAL YEAST COMPANY

Yeast requires sensitive drying methods. This Proctor installation at National Yeast Company maintains the uniform quality, color, and viability of the yeast at considerably increased drying rates.

Uniform product quality can be obtained only through flexible, sensitive drying methods. Proctor equipment provides the construction features and controls necessary to achieve uniform drying. Many materials heretofore considered unsuitable for conveyor drying can now be handled with speed and efficiency by means of Proctor pre-forming techniques. And, as always, Proctor equipment carries performance guarantees based on wide experience and careful analysis of the requirements. Write for complete information. Ask for bulletin #410.

PROCTOR DRYING EQUIPMENT FOR FOOD AND PROCESS INDUSTRIES

Tray Dryers
Truck Dryers Pre-forming Feeds
Spray Dryers

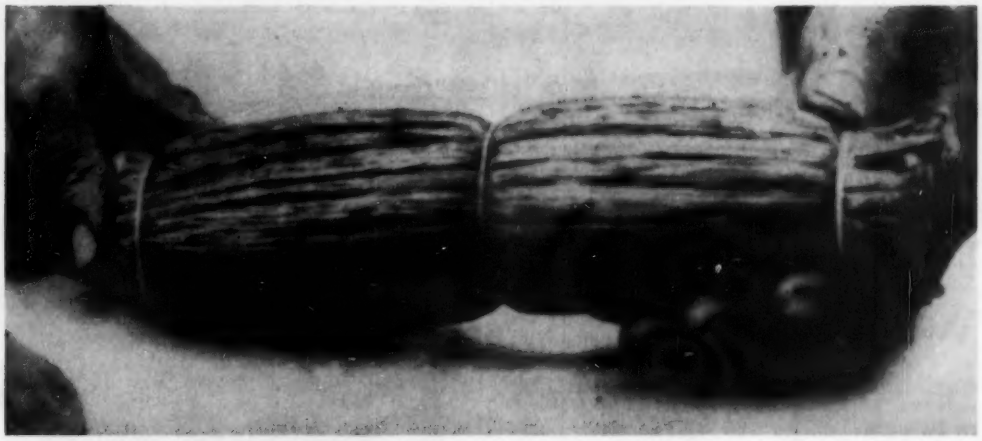
PROCTOR & SCHWARTZ, INC.

Manufacturers of Industrial Drying Equipment and Textile Machinery

Proctor

Philadelphia 20, Pa.

← For more data, circle this page number on card at back



CURED BEANS. Back when their cost was low, use of the pure extract became common. But when prices soared, it was a challenge to researchers—now answered by this development of a much more efficient extraction technique.

Gets 40% More Flavor In Improved Vanilla Process

JOSEPH MERORY
President, Merory Flavors, Inc., Clifton, N. J.

Big boost in aromatics is obtained through proper selection and blending of beans, grinding in solvent, careful extraction, and adequate aging of the extract

Basic in the manufacture of high-grade vanilla extract at a minimum cost are the following six factors—

1. Care given to beans by the importer and flavor manufacturer.
2. Proper blending of the various grades of beans.
3. Methods of subdivision and extraction.
4. Alcoholic strength of the solvent.
5. Alcohol content of the extract.
6. Aging of the extract.

And when the proper procedure is applied to each, a flavor bonus as great as 40% may be obtained.

Bean Sources and Treatment

Unlike other raw materials used in production of flavoring extracts, vanilla beans are not processed in the form in which they are harvested.

The flavor manufacturer buys so-called "cured" beans. But he has no influence on the curing process nor on the handling of the beans.

They are cultivated and cured in Mexico, Madagascar, the islands of Reunion, Seychelles, and Comores, Mauritius, Ceylon, South America, the West Indies, Java, and Tahiti. Differences in quality are due to weather, soil, and altitude at which they are grown.

The beans are packed in tin containers and should have on their label data as to origin, grade, size, date of cure, and moisture content.

Though information on the label may serve as a guide, it is still advisable to inspect and select the beans in the storage of the vanilla dealer. The selection is determined by the quality of flavor of beans in the pack.

Expert care should be exercised from the time the beans arrive at the dealer's warehouse until they are processed in order to protect them from damage, to improve their flavor, and to increase the yield of extractives.

Flavor Is Complex

Cured vanilla beans contain vanillin, secondary aromatic compounds, volatile oil, resins, organic acids, fixed oil, sugar, gum, tanin, wax, cellulose, and water. Their value is not determined entirely by the vanillin content, but more by their fragrance.

The secondary aromatic compounds are due to a complex of aromatic aldehydes, alcohols, and esters whose large number are different in the different

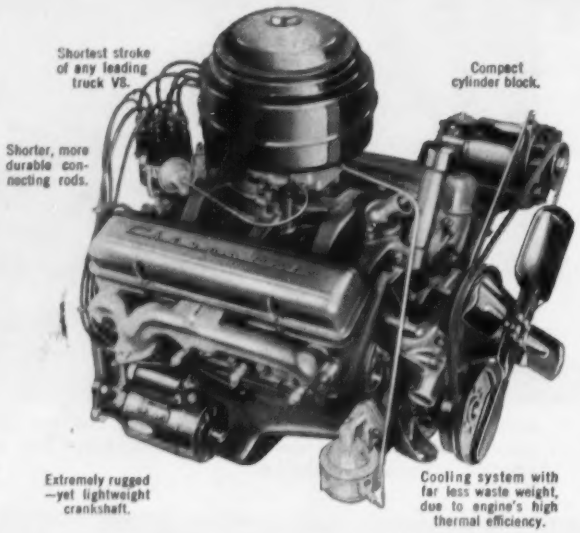
FROM "MERORY FLAVOR INDEX"

This article is based on more than four years of experimentation, during which time the author made up a large number of 100-gal. batches of vanilla extract.

He tested many grades of vanilla beans of different origin and storage properties. Numerous manufacturing procedures were tried, and various aging periods were applied to both the beans and the finished extract. All the findings were examined step by step, analyzed, and periodically evaluated. The findings were carefully recorded in the author's unpublished "Merory Flavor Index." This article, and others to follow, are from that source.

Some of the information was freely passed on to other flavor manufacturers for application and comparative testing. These manufacturers confirmed the improved flavor, and the increase in yields, obtained by the new extraction method that is detailed in this feature article.

Pound for pound the most powerful truck V8's are Chevrolets!


Shortest stroke of any leading truck V8.
Compact cylinder block.
Shorter, more durable connecting rods.
Extremely rugged —yet lightweight crankshaft.
Cooling system with far less waste weight, due to engine's high thermal efficiency.

Modern features such as these help pare off dead weight . . . assure maximum *working power* to pull your big loads more efficiently and economically. New V8's are standard in L.C.F. and top tonnage models, optional at extra cost in all other models.

They put out more horsepower per pound than any other V8 in any truck! That means greater efficiency, less dead weight, more pound-pulling power for you

Here's *proof* of years-ahead engine design! These new Chevy V8's weigh up to 200 pounds less than competitive V8's, yet are fully comparable in power output. Every last ounce of "flab" has been eliminated—and what's left is the leanest muscled, best-performing powerplant the trucking industry has ever known!

One basic reason for this compact efficiency is *short-stroke design*—the shortest stroke of any leading truck V8. Shorter stroke, of course, means less piston travel, less engine wear, maximum pulling power from less fuel. But, when combined with Chevrolet precision engineering, it means *even more*. It makes possible, for example, a more compact cylinder block . . . shorter, more durable connecting rods . . . a crankshaft that is lighter in weight yet extremely rugged. Here, every component part reflects hair-splitting efficiency that wastes nothing!

To you, it means *low-cost* hauling, longer engine life, weight-saving power to pull beefed-up loads! See your Chevy dealer soon for all the facts about the right V8 for *your* job. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Yes — there are lots of reasons why a Chevy truck will do more for you on your job!

In addition to great V8's, these brawny beauties now offer new high-compression sixes . . . a choice of manual or automatic transmissions in every Series . . . exclusive Powermatic transmission . . . tubeless tires . . . and many more far-ahead features.

CHEVROLET

NEW CHEVROLET TASK·FORCE TRUCKS

Anything less is an old-fashioned truck!

varieties of beans and in the different lots of the same bean. Together they form the balsamic fragrance typical of vanilla flavor. The volatile oil is also part of the balsam.

Resins are present in different types and in varying amounts in vanilla beans. When isolated, some of them have a pleasant taste but no odor. Resins constitute, largely, the lead-precipitating material of the beans. They are soluble in alcohol and in alkalis, and entirely insoluble in water.

Their chief function is as fixatives for the delicate flavoring compounds. For this reason, an extract containing large amounts of resins will retain aromatic compounds for longer than one that has smaller quantities of them.

The various acids present in vanilla beans are of no value in freshly made extracts. They become valuable, however, when chemical changes convert them to esters during the aging process.

Storage of Beans

Vanilla beans should be stored in open containers in clean places at a temperature around 50 deg. F. with low humidity. Under these conditions aromatic compounds continue to develop.

When it is desirable to reduce the moisture content (25-30% is best for uniform extraction), the storage temperature may be raised to 60-70% F. without loss of flavor.

Vanilla flavor is extracted from the beans with alcohol. (Any form of distillation destroys the fragrance of the aromatic compounds.) Best results are obtained with three consecutive extractions, at room temperature. Each should take a minimum of five days.

First menstruum should have a maximum of 65% alcohol. This content should be adjusted according to the moisture content of the beans.

Menstruum for the second extraction should be 35% alcohol, and for

(Turn to page 160)

• • •

Lower Cost Process Stops Wine Sediment

. . . and keeps it stopped—because ion-exchange resins solubilize bitartrates . . . And reportedly it's done at mere fraction of cost of removing them

McGRAW-HILL WORLD NEWS

Melbourne, Australia

A simple and economical technique for curbing precipitation of potassium bitartrate in bottled wine has now been hit upon by Australian researchers. Though harmless, the bitartrate deposit has remained a problem because it detracts from the product's appearance.

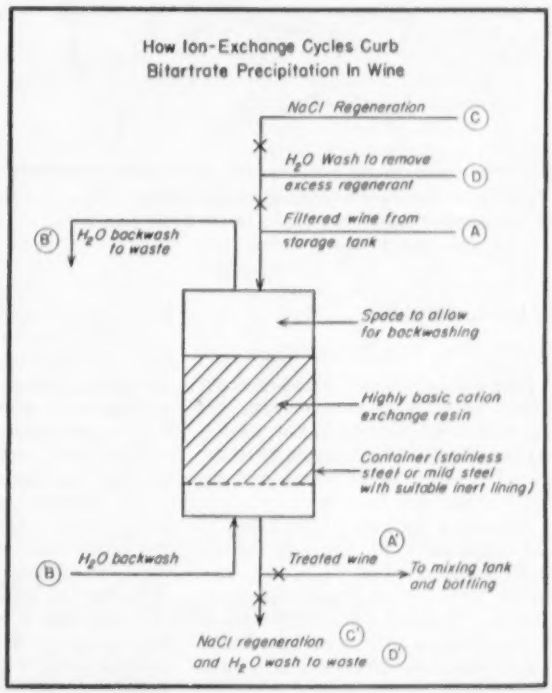
Commercially, wine has been freed of sediment by storing it in bulk under refrigeration, which decreases the bitartrate's solubility. When precipitation is complete the wine is filtered and bottled.

But capital outlay and operating costs for a large refrigerated-storage setup are high—hence the interest in the Australians' findings.

- Using standard ion-exchange cycles, they convert the potassium bitartrate to the soluble sodium salt without affecting the wine's palatability. This prevents subsequent formation of sediment—and at an operating cost reported to approximate 5% of the cost of required refrigeration.
- Resin treatment further boosts quality control by partially removing soluble trace metals (iron and copper) that cause haze and deposits.
- Finally, the process may be adjusted to raise the pH of a high-acid wine to a more acceptable level.

A number of large-scale processors in Australia have set up pilot plants. Indications are that equipment charges compare favorably with those for the refrigeration system.

* Oenological Section of the Australian Commonwealth Scientific & Industrial Research Organization, Adelaide.



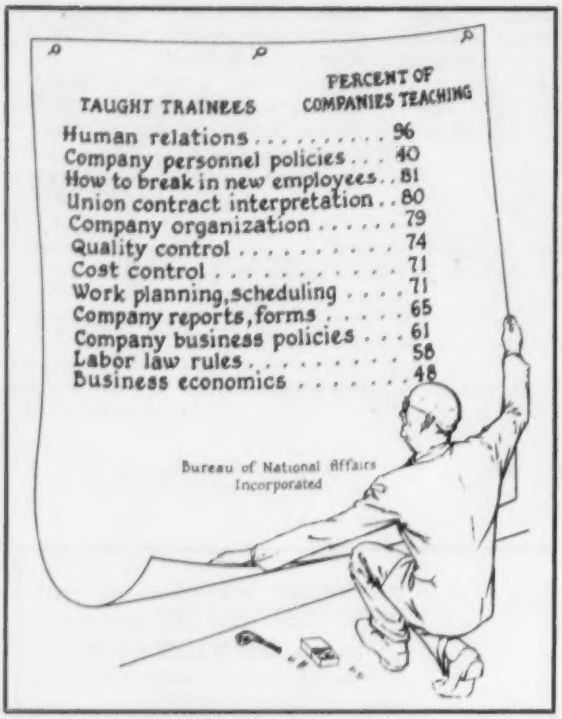
TROUBLESOME potassium ions in wine are exchanged for sodium ions (A-A') as resin is exhausted. Then, bed is backwashed (B-B') with soft water to remove adhering wine, and regenerated (C-C') with sodium chloride solution. Finally, wash water removes excess salt (D-D').

As a result, it is expected that commercial installations will follow in the near future.

The Process

Ion exchange takes place in a resin bed (see diagram) as wine passes through from the top. Strongly basic cation-exchange resins are most effective, treating about 70 bed volumes of wine before regeneration is necessary.

Regeneration consists of backwashing the bed with demineralized water, then treating with a downflow of sodium chloride solution, which goes to waste. Finally, a second water wash removes excess regenerant and the bed is ready for another exchange cycle.


TAUGHT TRAINEES
PERCENT OF COMPANIES TEACHING
Human relations 96
Company personnel policies . . . 40
How to break in new employees . . 81
Union contract interpretation . . 80
Company organization 79
Quality control 74
Cost control 71
Work planning, scheduling 71
Company reports, forms 65
Company business policies . . . 61
Labor law rules 58
Business economics 48
Bureau of National Affairs Incorporated

"This," said Ole, thumb-tacking a large chart on the wall, "shows the topics most often included in the training."

Ole Sage Episode

WHAT SHOULD YOU TEACH YOUR PLANT FOREMEN?

—This subject can get a bit complicated (to take the word of Batt Bulwark). Cost and quality control now loom large. Engineering is a further topic. And even psychology is found to be "on deck"

IVAN C. MILLER
Associate Editor, "Food Engineering"

Batt Bulwark noisily slapped down a pad of note paper alongside his empty dessert plate—as a distinct signal for the Guff & Gripers to cease their luncheon chit-chat and pick up again on foremen training.

Several of the men were smiling at this impatience of Mull & Mull's works manager. And Si Worth, personnel manager of Zenith Canning, chided: "Wonder what Batt'd do if this luncheon-wisdom wasn't for free?"

But Batt only drummed his pencil on the table to give accent while he prodded Ole: "Come on! Let's have that low-down on training the foremen—on *what* you hand 'em."

"Well, I just wish," mused Ole, "that it worked out as simple as you want it. But it doesn't. There's no general formula. Since such training needs will vary from business to business—and for that matter, from plant to plant—the program must be set up to meet very specific requirements.

"For best results," he added, "you even have to gear the program to the needs of individuals."

"But you make it all sound so complicated," lamented Batt. "Can't you just simmer it down to A-B-Cs?"

"Anyhow," plunged on Ole, "supervision is becoming professional, even at the foreman level. In some companies, but admittedly in only a few industries, college education, or the equivalent, is now a prerequisite for first-line management jobs."

"But *why*?" cut in Batt. "Just tell me *why* it is that . . ."

Up, however, came Ole's silencing hand. He'd anticipated such queries, and so he continued: "Yes, there are many 'whys', and we'll try to explain at least a few of them.

"Take this one: *Why* bring into *this* discussion those 'few companies' in those 'few industries.' Can't we just keep it to food plants?"

The nods indicated preference for sticking to food plants. But Ole wouldn't be side-tracked. He went on: "Requirements for foremen in today's auto and aircraft industries, also in the electronics and instrument fields, actually mirror the needs of our own food-industry foremen.

"In fact, if one of the foremen in a 'quite-modern' food plant of 20 years ago had taken a Rip Van Winkle absence and only just now returned, then he'd likely find himself wholly inadequate to measure up to the present first-line management requirements."

"Ah, what's so different" blurted Batt, "I sure can remember back 20 years ago, and . . ."

"Yes, of course you can remember," interjected Ole. "But you're forgetting all you've learned through experience and study during the intervening years. I doubt, Batt, if you are even consciously aware of some of the most important progress you've made in the last 20 years."

Batt looked puzzled, "Not me," he started to deny. But then he noted the agreement around the table and so he concluded: "Then I must have been an awful punk back there in '36."

When the laughs subsided, Ole picked up again: "Let's really look back. Two decades ago, very few foremen needed to concern themselves with costs—as they do in so many industries today, and as all of them must tomorrow. Cost determination and application requires more than simple arithmetic. To say the least, it includes accounting and record-keeping.

"Maintaining quality control, and balancing quality control with costs, as a part of present day or near-future foreman duties, demands knowledge unknown or not viewed as essential 20 years ago."

"Ole, you're getting too far ahead of us," criticized Ed Strong, superintendent at Zenith Canning. "A lot of this sounds to me like crystal gazing." Ed looked around the table and, find-

ing approval, continued: "It doesn't seem to me that all this advanced type of training applies to the food industry, even though it may to some others."

"In general you're right," agreed Ole. "However, even today a few food companies are installing the most advanced management procedures, controls, and training. There's now coming in many industries—not excluding the food industry—a trend toward increased mechanization and automation. And this emphasizes a need at the foreman level for an understanding of engineering and the application of engineering principles.

"What's more, there are many other management tools once considered important only at top-brass levels (if considered at all) that are now, or soon will be, required tools at the level of first-line management.

"Psychology, whether or not it's recognized and applied as such, is now an everyday tool in a number of companies. And certainly it will be a significant, even an indispensable tool of tomorrow's efficient foremen, as well as higher management."

Ed Strong was fidgeting. "I think Batt will agree with me", he remonstrated, "that this isn't exactly what I expected under the heading of what they're to be instructed."

"Well, from what you've already said," countered Ole, "I take it you do agree with what I'm trying to establish—namely, that the nature of the training must depend on plant needs, and on those of the individuals. If you endorse that, then I'll go on and try to simplify it."

"Sure, go right ahead," broke in Batt. "It can't get much more complicated, of that I'm sure."

Ole's eyes twinkled. "I said I would *try* to simplify—even though training today isn't simple. In truth, it never will be, because those courses we've mentioned cover only a few, by no means all, of the skills in question. In any event, these and many more will soon become fundamental—and food-plant managements aren't excluded."

"Ole, you say these are but a few," spoke up Personnel Manager Milt Sorenson, "Well what are the rest of them. In other words, Ole, name off the subjects foremen should know, or the subjects they should be taught."

"As I said," pursued Ole, "the needs vary from plant to plant and from trainee to trainee. But I think we can get a fair index, nevertheless, by taking a look at things covered in present programs."

He then unrolled a large chart and thumb-tacked it to the wall. "This," he said, "shows the topics most often included. It's based on a recent survey of member companies of the Bureau of National Affairs, headquartered in Washington.

"In fact, I've made a number of charts, and I'll tack them up here so you can take notes on them, copy them, or whatever you wish.

"This first one, as you see, shows that fully 96% of the companies put human relations into their foreman-training programs. And 90% included company personnel policies."

He paused to let them study down the tabulation. Then he unfurled and posted two other charts. "These," he said, "are results of American Management Assn.'s two most recent management training programs. They indicate that management training now falls into three general categories: (1) Human relations, (2) communications, and (3) administration. In these studies, foremen were included in approximately 75% of the management training projects."

"I'm still confused," confessed Batt. "Just what do you mean by 'human relations'?"

"Well, let me run down the list," answered Ole. "First, *industrial relations* spans the field of relationships and associations covered by the labor contract. Conflict of interest and intent should be confined within this labor-relations area.

"Then *personnel relations* cover all those associations of management and employees within the organization. And *Community relations* include all associations and contracts between the company or its employees and the community in which it operates.

"As for *public relations*, they cover all contacts and all associations of not only all members of the organization, but also its products with the total public far and near. And here are included not only the customers but also the prospects.

"Finally, all these together make up *human relations*.

"Now, let me anticipate the next question," continued Ole. "Communications include everything written, everything spoken throughout the organization—also the many ideas and impressions, rightly or wrongly conveyed without the use of written or spoken words.

"Training in 'administration,' which is a word Webster defines as 'the performance of the executive duties of an institution, business, or the like,' may include, among other subjects, supervision, cost control, organization, general management, accounting, policy formulation, financial management, office management, production management, business law, scheduling, inventory, and work simplification."

Ed Strong sighed. "I hope that our next phase—'How to teach 'em, and who's to do it'—won't be as inclusive, or as elusive, as this matter of 'What to teach 'em,' has been."

"Well," said Milt Sorenson, as he joined those gathering around the charts on the wall, "there you have it for our next meeting—the 'How' and the 'Who'."

Readers are invited to contribute their comments on any points raised in our Ole Sage Episodes. Just address Editor, "Food Engineering," McGraw-Hill Pub. Co., 330 W. 42nd St., New York City 36.

From Ole's Notebook

What's a Fair Contract?

If skill and intelligence are exercised by both negotiators, and if pitfalls are avoided, a good contract will be produced—one which provides for mutual benefits between employers and employees.

It will be one which permits the company to prosper, and the workers to share in this prosperity.

A good contract recognizes the teamwork of employer and employee. Such a contract admits to basic management rights and functions, also to employee benefits. But it does not erect barriers to harmonious employer-employee relations through "protective" clauses.

In the final analysis, a union-management contract is essentially a working agreement by which two collaborators seek to blueprint their teamwork arrangement. Such agreement should avoid the quicksands of one-sided domination and punitive measures.

Harmonious labor-management relations are built only upon mutuality of purpose and respect for the other party's rights, responsibilities, and functions. — *"General Management Series," American Management Assn.*

Need Facts for Decisions

"No person's decision can be better than the information upon which it is based.

"In the field of union contracts, an uninformed, or poorly informed, ne-

gotiator is practically certain to be a bad negotiator. He will often concede points without understanding their full significance and impact. Equally, he will often make mountains out of molehills and create needless impasses.

"Labor relations is a big job, a very complex job. It is particularly difficult for most smaller business men to keep abreast of industry and area changes in union contracts.

"But it remains that the average negotiator is a lost lamb if he is not adequately informed."—*Richard P. Doherty, President, Television-Radio Management Corp., Washington, D. C.*

Job-Environment Switching

Studies show that it's one thing to take a man from his work environment and help him to change in a horizontal group—but when he returns to his own unchanged work-group environment, what tends to happen is this:

A. He is rejected by the other unchanged persons, or

B. Becomes completely frustrated because of his inability to apply his *changed* concept to the *old* organization.

On the other hand, observation of vertical groups has indicated several important and immediate gains:

1. Release of repressed feelings between superior and subordinate, and a subsequent more friendly and frank relationship.

2. The working-together of different levels of management in a common problem-solving effort.

3. Increased tolerance and understanding among the varying levels of management.

4. The inception or strengthening of a "we" team-feeling.

However, it is of interest to note that trainers have found the horizontal groups much easier to work with. These groups have little or none of the repressions and aggressions fostered by the vertical groups' consciousness of status, and of their past, often unsolved, interpersonal problems.—*Michael G. Blandsfield in Mar. '56 "Personnel," American Management Assn.*

Strong Stewards Best

A number of surveys of unionized plants have indicated that it is to management's advantage to have strong stewards.

Several of the studies have compared the foreman-steward relationships, with these results:

The plant departments rating best in productivity, morale, etc., were those where both foremen and stewards were strong. Conversely, the poorest were where both were weak.

In between, it was surprising to find indications that departments with weak foremen and strong stewards performed somewhat better than departments with strong foremen and weak stewards.—*"Human Relations in Small Industry," McGraw-Hill Book Co.*

Unions Are Big Business

No less than $457 million in dues is received each year by 194 labor unions—representing 98% of total national and international union membership in the U. S. and 75% of unionized labor in Canada.

Of this amount, approximately $228 million is turned over to the international or national headquarters of the various unions in per capita taxes, while the remainder stays in local union treasuries.

Constitutions of most of the 194 unions set a minimum or maximum (or both) on dues and initiation fees that the local unions may charge. Within these limits, the locals usually may set their own amounts.

Initiation fees vary from 65¢ to $250, with the highest fees in the maritime and craft unions.—*National Industrial Conference Board, New York City.*

Disputed Promotions Gaged

Harvard Business School students examined 58 arbitrator decisions that had reversed the action taken by management regarding seniority, skill, and ability promotions. No decision was less than three years old at the time.

Companies were asked for work histories of senior employees whose grievances were sustained. Did they prove able in the higher positions?

Though any biases exposed in the replies can be assumed to be confirmations of the company's original position, nevertheless of the 46 written or verbal responses received, it was stated in 29 that the senior employee had proved himself able on the new job, either immediately or within a short period.

Even more significant are the frank statements in 22 of the 29 cases, that supervising management doubts whether the junior employee originally favored by management would have done any better on the job. Furthermore, in 16 of the 29 cases the senior employee has been advanced subsequently to jobs rated still higher.

In only 10 of the 46 cases did management assert they believed the arbitrators' decisions were unsound.—*American Arbitration Assn.*

Irradiation of Foods

—*Continued from page 85*

Three years of intensive experimentation by the Army—and some isolated work by private industry and universities—have demonstrated that ionizing radiation can do a superior job in killing microorganisms and insect pests, thereby greatly extending the shelf-life of foodstuffs. Many quality problems are involved, but these are not too severe for some applications (see FE, Aug. '55, p. 43).

Pilot Plant by 1958

The Quartermaster Corps is teaming up with AEC to build a completely equipped processing plant, with its own source of nuclear radiation (a $3 million reactor), to irradiate 1,000 tons a month of food. Potatoes and pork products, and possibly beef, are likely to be the first irradiated foods reaching Army mess halls from this small plant. Target date for the pilot plant is October, 1958.

The unique equipment planned for the pilot plant—whose location has yet to be determined—makes it a poor barometer for gaging costs of a commercial plant. To get a line on the latter, the Army has contracted with a nuclear reactor builder to study probable costs. The results will be made available to industry about six months from now.

New packaging problems are involved in irradiation. But Capt. Reuben Pomerantz, Radiation Project Officer of Quartermaster Food & Container Institute, expressed confidence the answers will be found by the time the food industry is ready to move into the irradiation field in a big way.

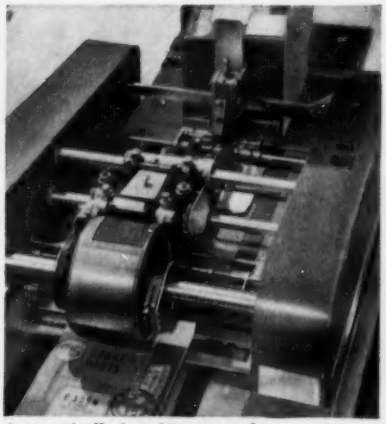
So far, the flexible packaging material showing most promise is du Pont's Mylar polyester film, see article, p. 69). Right now, this film is relatively expensive. But it's expected that ways will be found to reduce the cost, as production volume increases.

Sees Little Federal Control

The Army panelists agreed that the food industry will be able to adopt ionizing radiation methods without fear of burdensome government controls. But there will be some restrictions.

The Food & Drug Administration, Col. Jackson said, is certain to ask Congress for legislation requiring manufacturers to inform the housewife —by date-stamping the container—exactly when the packaged food item received its radiation treatment.

End (Resume reading on page 86)



Automatically imprints at speeds up to 7,500 items an hour!

- Makes a high-quality impression, with accurate register, in an area as large as 4 by 18 inches.
- Handles coated and uncoated paper and board, cellophane, plastics, foils . . . in sizes up to 18 by 18 inches, from .010 to 3/16 inches thick.
- Uses instant-drying, flexographic ink which does not have to be mixed. Printing drum uses rubber mats or metal type from 6 pt. up.
- PB Power Stacker shown with Imprinter, has large capacity, keeps imprinted material in order and easy to handle and remove.

Seen this amazing new PB Package Imprinter?

It imprints, marks or codes . . . folding cartons, bags, envelopes and other containers up to 7,500 per hour. Permits packages to be printed only as needed to meet current production . . . cuts container as well as printing costs, prevents waste of pre-printed material. Ideal for imprinting dealer advertising literature . . . Adjustable without tools, it can be easily operated by anybody . . . Offers a big savings in packaging for everybody! . . . Call the nearest Pitney-Bowes office for a demonstration – soon! Or send coupon for free illustrated folder and booklet of case studies.

PITNEY-BOWES

Imprinting Machines

Made by the originators of the postage meter . . . Service from 272 cities in U. S. and Canada.

PITNEY-BOWES, INC.
3827 Crosby Street
Stamford, Conn.

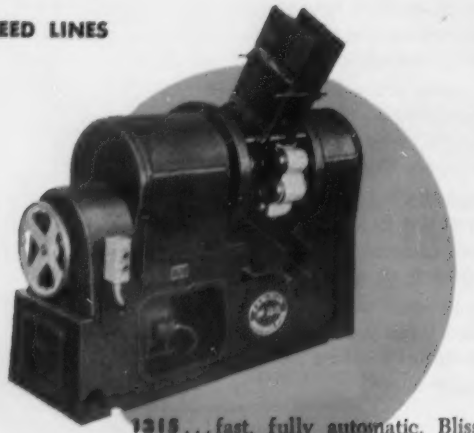
Send free Package Imprinter folder and case studies to:

*Name*_____

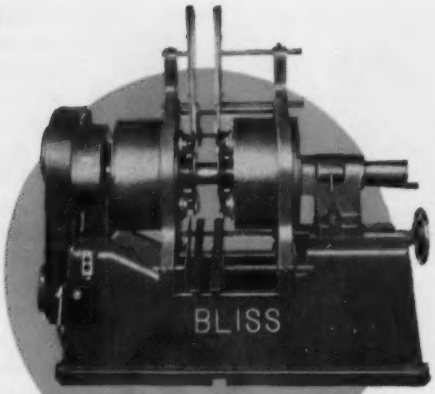
*Address*_____

For more data, circle this page number on card at back →

FOR HIGH SPEED LINES



1315... fast, fully automatic, Bliss' 8-station, rotary round can double end flanger handles diameters from 2 to 4⅜", heights from 2 to 8".



1416... big brother to the 1315, this double end, 4-station rotary round can flanger handles No. 10 and other sizes.

4 newly-redesigned flangers by BLISS

Here are typical improvements:

On the rectangular flangers... Bliss' exclusive flanging action eliminates danger of body buckle; dies never "squeeze" bodies, never exert damaging end pressure. Extra-long slide gibbing means longer service life.

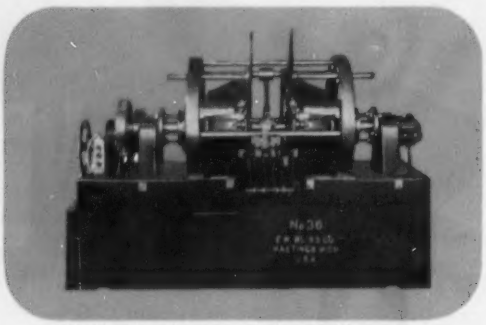
On high-speed round can flangers... Long cylinder slides provide more accurate alignment, last longer. Small diameter turrets work smoother at high speeds.

Rectangular or round, *all* Bliss flangers feature heavy, vibration-dampening frames, modern motor drives and controls. Improvements like these are typical of the news that's coming from Bliss' new plant at Hastings, Michigan. A new scroll shear, new strip feed press—in fact, Bliss' entire line of high speed machinery has been redesigned with an eye to greater accuracy, lower maintenance and longer life.

You'll want to learn more about Bliss automatic and semi-automatic can machinery—the most complete line in the industry: write today for complete information.

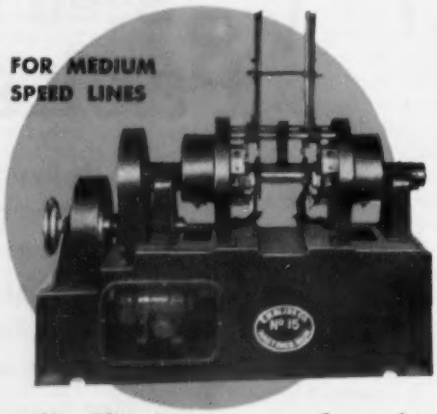
E. W. BLISS COMPANY • *General Sales Office: 50 Church St., N. Y.*

CAN MACHINERY DIVISION: HASTINGS, MICHIGAN



35 & 36... largest of them all, these 4- and 3-station, double end, rotary machines flange square, rectangular, oblong cans up to 8¾" high.

FOR MEDIUM SPEED LINES



15... Bliss 4-station, rotary flanger for round cans from 2 to 4⅜" in diameter, from 2 to 8" high.

BLISS SINCE 1832 *is more than a name... it's a guarantee*

BLISS CAN AND CONTAINER MAKING MACHINERY

Letters to the Editor

Two Readers Take Exception To Points on Dietetic Foods

Dear Sir:

You are to be congratulated on your recognition of the growing importance of low-calorie foods, both to the food industry and in the national diet, as evidenced by your recent articles on dietetic foods (FE Dec. '55, p. 70; Mar. '56, p. 92). However, I take exception to several points in the latest article.

1. Referring to carbonated beverages in which sorbitol or artificial sweeteners are used in place of sugar, the author states: "Strictly speaking, the beverages are not low in calories."

This statement is wholly incorrect.

Most regular carbonated beverages, other than club soda, contain from 6 to 12, or even more, grams of sucrose per 100 ml. Thus, their calorie content is from 43 to 85, or more, calories per 6 fl. oz.

Most dietetic carbonated beverages (and their current number and total sales volume are not very accurately described as "being marketed to a limited extent") contain no source of food calories other than about 0.1% to 0.25% of citric acid, and perhaps a trace of alcohol and/or propylene glycol from the flavoring extract. A few contain up to about 0.1% of pectin, or other bodying agent, that may be partially metabolized.

Practically all are sweetened with calcium cyclamate, a completely non-nutritive sweetener, although some contain from 0.3% to 1.5% of sorbitol, added primarily for "body" and "mouthfeel," and only incidentally contributing a small part of the total sweetness.

Thus, these dietetic beverages provide only from about 1 to a maximum of about 12 food calories per 6 fl. oz. Surely, by any standard, they are low in calories. And incidentally, when properly formulated, they compare very favorably in flavor and overall palatability with sugar-sweetened beverages.

2. On the other hand, referring to aerated confections, the author states: "They are low in calories because their bulk has been increased by aeration."

This is, to say the least, misleading. Of course, aeration will reduce the calorie content per unit volume, but calorie content is generally stated on a weight basis. Actually, the somewhat lower calorie content of marshmallows, nougats, and frappes, as compared with that of many other candies, is due to their lower fat content and higher moisture content—not to aeration.

3. Both the statement in the opening paragraph that "anyone buying low-calorie foods is actually admitting lack of will power" and the author's prediction that "laws will be passed stipulating that no dietary food can be marketed unless it has the nutritional quality suitable for the general public" suggest unfortunate attitudes toward low-calorie foods.

The first implies some puritanical virtue in abstention as a means of controlling calorie intake. The second suggests that such virtue should, or will, be enforced by law.

It may be hedonistic to wish to satisfy the appetite with an ample quantity of delicious foods and beverages, while keeping the waistline down by use of low-calorie products, but it is both a more realistic and a more pleasant approach to the problem of weight control than abstention.

Certainly, low-calorie foods should be subjected to the same strict official regulation and control—as to safety, sanitation, quality, labeling and advertising—as all other food products. However, the only justification for such regulation, and this is written into the very laws which provide for it, is to protect the public interest.

With overweight constituting a serious health hazard for a very significant fraction of our population, surely it is in the public interest to promote and encourage more and better low-calorie foods, not to throttle their development by unnecessary and unreasonable restrictions.

4. Finally, while the author uses the generic term for most of the products mentioned, even where he also mentions the trade name of a particular manufacturer, he fails to mention cyclamate by name, using only a single brand name for it.

Since this important non-nutritive sweetener is now manufactured and distributed by at least four different companies (Abbott, du Pont, Merck and Pfizer), it really should be referred to, at least in technical and general articles, by its generic name of "cyclamate," rather than by any one of the several trade names.

Despite these points of criticism, the article by Mr. Alikonis contains much useful information and represents a contribution to general knowledge of the important field of low-calorie foods.—*L. C. Cartwright, Account Executive, Foster D. Snell, Inc., New York City.*

Another Criticizes

Dear Sir:

I would like to call attention to some of the statements made in the article, "Dietetic Foods," by Justin J. Alikonis (FE Mar. '56, p. 92).

In speaking of low-calorie foods, the author says:

"Beverages: Sorbitol or artificial sweeteners are used in soft drinks, in place of sugar. Strictly speaking, the beverages are not low in calories. But they are advertised with the notation 'No Sugar' (meaning they contain no cane sugar) to convey a psychological effect."

This statement is, I feel, completely erroneous and quite unfortunate. Dietetic soft drinks are actually very low in calories when made without sorbitol, as a number of the popular dietetic soft drinks are made. In the case of Hoffman Streamline beverages, where only natural flavoring materials—calcium cyclamate, citric acid, and caramel color, where necessary—are used, the caloric content is in the neighborhood of 1-2 calories per 8-oz. portion.

This is a demonstrable fact and has been proven by analytical work, both in our laboratories and in outside consulting laboratories. Other reputable producers of dietetic soft drinks claim, and have, equally insignificant caloric values.

The categorical statement by the author that: "Strictly speaking, the beverages are not low in calories" must be based on a misconception. The further intimation that they are erroneously advertised as containing "No Sugar" reflects seriously on the integrity of the many sincere producers of this type of dietetic product.

Elsewhere the author states:

"Emphasis will then be on dietetic foods containing slowly assimilable sugars such as unrefined cane or beet, corn syrup solids, sorbitol, and mannitol. These should be combined with vegetable proteins such as the new water-soluble gelatin and nonfat milk solids, which are retained longer in the digestive tract."

The listing of unrefined cane or beet sugar and of corn syrup solids as "dietetic foods containing slowly assimilable sugars" raises some interesting questions. I do not know of any sugars other than sucrose that are present in any appreciable amount in unrefined cane or beet sugar, and certainly the carbohydrates in corn syrup

solids have not been considered slowly assimilable in the past.

Furthermore, listing sorbitol and mannitol as "containing-slowly assimilable sugars" is not quite factual. These products do raise the blood sugar level at a slower rate than sucrose when ingested and metabolized, but can they be said to "contain" sugars of any kind?

Also, the statement quoted directly above lists "the new water-soluble gelatin and nonfat milk solids" as "vegetable proteins." This statement appears to be unfortunate at least. [Editor's note: This wording is not that of the author. A transposition of words was inadvertently made in typing the edited manuscript.]—*Philip D. Kratz, Laboratory Director, Hoffman Beverage Co., Newark, N. J.*

Author Defends His Points

Dear Sir:

Thank you for the copies of the letters from Mr. Cartwright and Mr. Kratz, commenting on my Dietetic Foods article. [See above letters.—Editor]

Regarding beverages made for the diabetic field—containing no sugar whatsoever, and made from calcium cyclamate, citric acid, and caramel color—there is no question as to their very low caloric content.

My reference was to beverages in which sorbitol or artificial sweeteners are used in place of sugar (sucrose) only. Other sweeteners—such as corn sugar, corn syrup, and honey—are used with only a small reduction in calories.

Yet these beverages are advertised as being calorie-controlled and containing less calories than ordinary soft beverages. It is to these types of beverages that I refer as being supposedly low in calories because they are advertised to contain no sugar. I can see where Mr. Cartwright and Mr. Kratz are justified in their views.

In regard to the question about confections whose bulk is increased by aeration, I really feel this is a matter of opinion. It is my opinion that you obtain the same effect from a product whether you add an additional 20 or 30% of a bulking agent (without calories), or whether you actually aerate the product and give it an extra volume of 20 to 30%.

Mr. Cartwright is correct in his statement that most marshmallows and frappes, and some special nougats, are lower in fat content. But actually the higher moisture content has more to do with the lower calories on a weight basis. Yet I am sure Mr. Cartwright will agree with me that the amount of calories on a volume basis should be credited to aeration.

Should we promote foods that contain artificial sweeteners in which there is a very meager saving of calories, whereas the same results could be obtained by eating 10 to 20% less of food minus these artificial sweeteners? What reasons has a healthy person to buy low-calorie foods to lose weight, when it can be done without injury to health by cutting down on caloric intake?

Any low-calorie food or reducing plan that is not nutritionally balanced is dangerous to health if nutritive requirements are not met. Nature has certainly endowed us with many low-calorie products such as fruits and vegetables.

The survival ration worked out by the Quartermaster Corps is very high in calories from a unit-weight basis. Yet it is nutritionally balanced to protect a person on a starvation diet, and it therefore has a place in survival rations. Certainly a person should be able to reduce on a survival ration.

I do want to thank Mr. Cartwright for his kind remark that the article contained much useful information and represents a contribution to general role of the important field of low-calorie foods. I have received many favorable comments on the article and would like to quote one paragraph that came from a reader in Hawaii:

"We read your article in FOOD ENGINEERING, 'Dietetic Foods,' and we were particularly interested in your views on foods for diabetics. We repeat here one of the statements that you made: 'Even for a special dietetic food for the diabetic, there definitely is a need for nutritional balance in the diet, and certain carbohydrates are necessary for the proper functioning of the body.'

"You then go on to explain that while saccharin and Surcaryl have been very important artificial sweeteners for the diabetic, certain sugars and sugar derivatives are essential in the diet also. This is in close agreement with recent findings of Dr. Carlos Lamar of the University of Miami Medical School, who advocates a balanced diet for diabetics, including carbohydrates and especially fruits, honey, etc., which are high in levulose content."

To comment further on the various points of view in the two letters that you received is not necessary. I am sure that the controversial points are more a matter of individual personal opinion on the place of low-calorie foods in the food industry.—*Justin J. Alikonis, The Al-Chem Laboratory, Inc., Bloomington, Ill.*

End

Cutting Fruit Loss

—*Continued from page 53*

to determine when the solution should be changed.

After peeling and inspection, fruit is graded into eight sizes, which are chuted to a complex conveyorized distribution system. By adjusting diversion sweeps, one operator controls the flow to seven hand-pack fillers.

During a day's operation, up to 25 tons/hr. of peaches may flow through these lines. Here they are separated into eight grades (four quality grades, with three varying degree Brix syrups) and packed in four can sizes. In such production, there is no room for obsolete manual-handling methods.

The finished, sterilized and cooled product moves by cable conveyors to the labeling and casing department and then to palletized storage by lift-truck.

End (*Resume reading on page 54*)

Robot Mayonnaise Line

—*Continued from page 65*

controlled by a modulating-type valve activated by a level control. When the height becomes excessive, the level device operates a throttling valve through which the excess is returned to slurry tank.

Slurry enters at the top of disk blender and semi-emulsion is drawn from its bottom outlet into the Girdler-AMF (American Machine & Foundry Co.) emulsifying head.

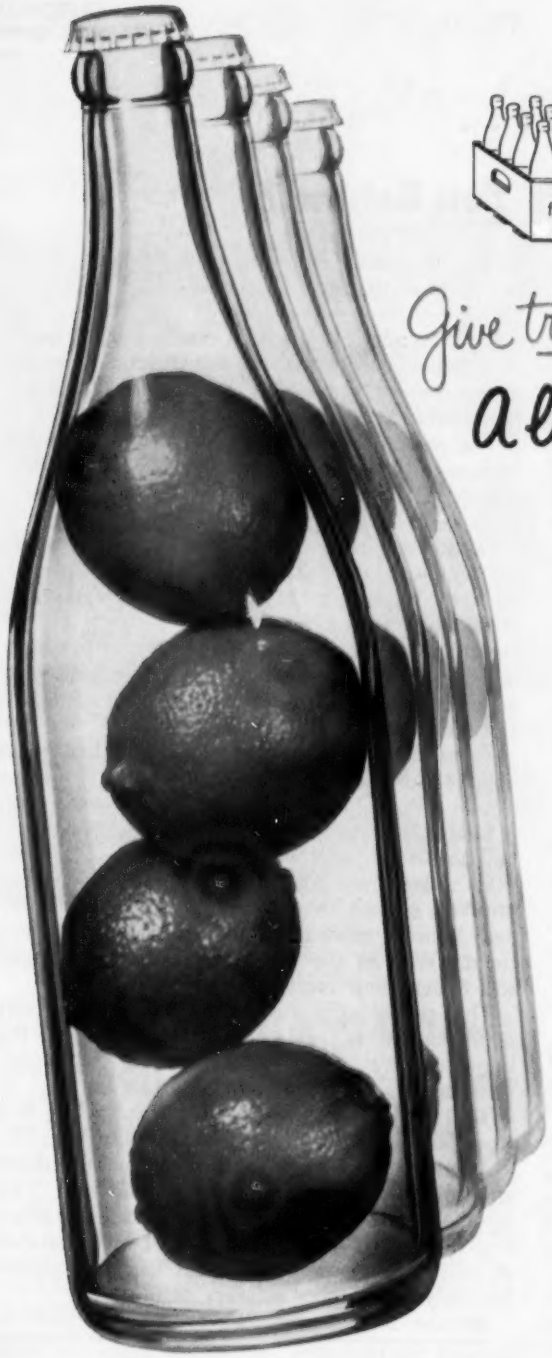
Rotor part of head consists of a series of disks, each having peripheral teeth. Influencing the degree of emulsification are the number of disks, distance between them, number and size of teeth, and motor speed.

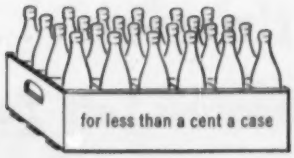
The stator, consisting of toothed rings (which intermesh with the toothed disks), is hinged to simplify inspection and cleaning. Introduction of nitrogen is simple and is controlled by standard-type equipment.

Finished product is pumped into product-storage tank. Manufacture of mayonnaise follows the same procedure, except that starch base is not added to the premixer.

Filling, capping, labeling, and casing must also be fully mechanized to complete the automated system. These operations are successfully carried out in other industries, hence should not be a serious problem.

End (*Resume reading on page 65*)





Give true fruit flavor

a long lease on shelf life!

with PFIZER ASCORBIC ACID

...protects soft drinks against flavor-fading (and color-fading, too)

● No one needs to tell you that *soft drinks don't mellow with age.* Long shelf time can hurt your product's flavor and color—citrus drinks most of all.

But maybe you don't know what a simple way there is to extend shelf life—*and for less than a cent a case!* (twenty-four 12 oz. bottles). All you do is add a small amount of Pfizer Ascorbic Acid when you prepare your syrups (ascorbic acid is a normal food component—Vitamin C).

Pfizer Ascorbic Acid counteracts the effects of oxidation that cause flavor and color to fade. Keeps beverages fresh far longer! It does this equally well for either bottled or canned beverages. Does it safely and economically.

Bottlers who are now adding Pfizer Ascorbic Acid to soft drinks report a significant increase in shelf life. In some tests shelf life has even been *doubled.* Why not protect the sales of your products, too? Test Pfizer Ascorbic Acid in your own flavors and formulas. And write for our *Technical Bulletin 86.*

Manufacturing Chemists for Over 100 Years **Pfizer**

Chas. Pfizer & Co., Inc., Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N.Y.

Please send me ☐ *Technical Bulletin 86*
☐ *a 125-gram sample of Pfizer Ascorbic Acid.*

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

E

Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Tex.

In Behalf of Progress . . .

Has Packaging Progress Left You Behind?

Progress in packaging has been so steady as to create few great flurries of excitment. Yet it has gone so far in so many ways that its total impact is of tremendous proportions.

So its significance should be put into perspective in the minds of all in the food field. Otherwise the challenge and the opportunities offered by the improvements may go unheeded.

Many may have been lulled into complacency by the monotony of the trend or confused by the complexity of developments.

The modern era of packaging had its start about a quarter of a century ago. When supermarkets hit the scene in a significant way, they put a premium on self-selling containers. At about that time, too, important innovations in packaging materials became available.

In those days great emphasis was placed on the eye appeal of the container. And hand-in-hand with this was extensive evaluation of the quality-protective features of attractive new materials.

There has been no slackening of these interests. But attention in subsequent years has focused also on better equipment to form, fill, close, label, code, and case containers.

'Tis said that nothing happens on the production line until a sale is made. Which points up the importance of the eye appeal of a food container. But it also is axiomatic that a poor production operation will foul the sales sparkplug.

A top executive with a container company recently made this observation:

"Those of us who have lived with packaging for a long time—who see the dramatic role good packaging plays in shaping the profit or loss statement—are moved, understandably, to wonder only at the fact that so many corporate managements have not been quicker to utilize the volume-building and profit-making advantages of good packaging that so many successful companies already have put to work."

And those of us who have visited plants in the industry over the years wonder, too. We wonder why so many have been so slow to capitalize on advances in packaging-line operations.

It is quite common to see food products manufactured by a small number of workers, then packaged by a large labor force. Often, more than half of the plant labor is engaged in one unit-operation—packaging.

If you were one of the 28,000 who packed the recent AMA Packaging Exposition, you will realize that there are machines, materials, and methods available to step up packaging efficiency terrifically.

In fact, you can measure packaging progress by the size of this show. The first one, 25 years ago, didn't fill a small ballroom. But this one packed two floors of the huge Convention Hall in Atlantic City.

Little wonder. It has been estimated that nearly nine billion dollars is spent annually on packaging in this country. And some 31 percent of that figure is involved in packaging foods.

The packaging bill will get larger, too. It must because of the trend in convenience foods—the bite-size, prepackaged, precooked—all but pre-chewed—ready-to-eat foods.

Consumers have demonstrated a willingness to pay for convenience. It saves so much time. According to the Department of Agriculture, a typical home-prepared meal involves 5½ hours of work and an expenditure of $4.90. A partially-prepared dinner takes 3.1 hours, and costs $5.80. While a ready-to-serve repast works the homemaker only 1.6 hours, and nicks the food budget $6.70.

These data show that Mrs. America can get 4 hours of free time for $1.80, or 45 cents an hour—a good bargain, considering that the minimum wage is $1 an hour. It's an especially good buy for the 12 million women who work.

So convenience foods, and the extra packaging involved, are not luxuries. And every branch of the food industry must go along with the convenience trend. Witness the current rush to prepackaged and frozen fresh meat cuts.

This points up a further need to know about improvements in packaging. To know what the thousands saw at the last Packaging Exposition, many of whom are your competitors.

To help you here, we present a special picture report on the latest in packaging machines (p. 70).

The machines were photographed by our editors after careful study of everything exhibited. This report merits careful scrutiny. Pay particular attention to the machines that perform new operations, as well as to those with higher capacity, greater flexibility, and higher accuracy of fill.

Become familiar with what's now available to improve the packaging line, and to make new types of packages—even products—possible. Then follow through with such organization and procedures in your company as will enable you to capitalize on these developments.

At the least, you need a packaging committee with members from production, quality control, research, new-product development, and sales—including some good idea-men. Then make this committee work.

To fail to keep up with packaging progress is to risk failure in your business.

When shoppers compare your products with other brands...

...CELITE FILTRATION provides perfect clarity... assures appetizing appeal

In today's highly competitive market, it is vitally important that processed food products *look* good as well as *taste* good. For in a shopper's eye clarity is often a measure of purity. That's why so many processors are turning to Celite* diatomite filtration.

By means of a filter cake hundreds of times finer than the finest wire mesh, Celite polishes liquids to a dazzling clarity. And it does it economically, too. Celite is low in cost. It provides practically automatic operation with any standard pressure filter. And you needn't worry about a clarification bottleneck. Celite works at fastest flow rates.

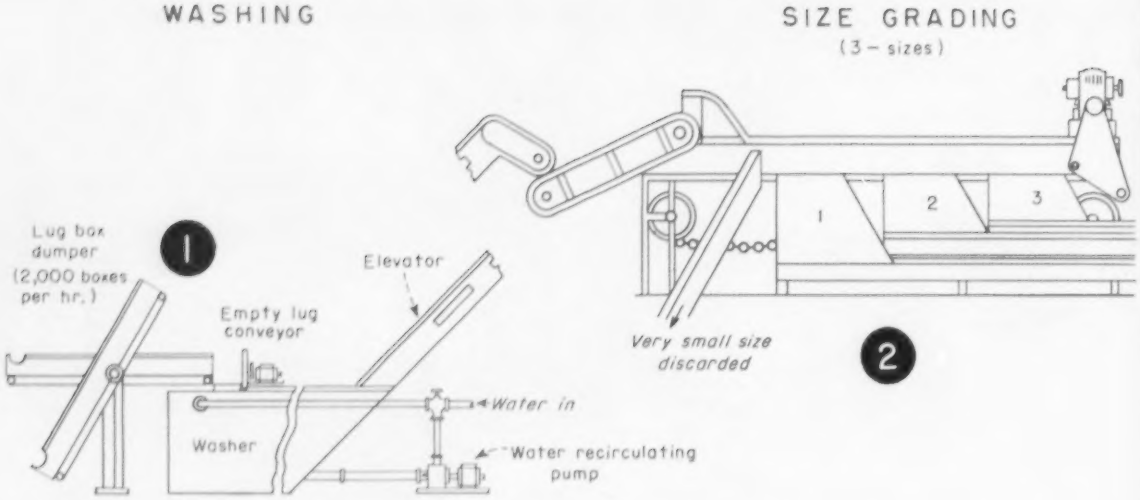
Thousands of processors are using Celite today for filtering sugar, beer, fruit juices and jellies, cooking and salad oils and many other products. Why not ask one of them about Celite. Better still, get the complete story from Johns-Manville.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

When you filter your product with Celite you get the extra sales appeal of sparkling clarity.

Tell us what you make. We'll tell you if and how Celite can help you make it better. Write to Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit, Ontario.

Johns-Manville CELITE FILTER AIDS



Outstanding Cling Peach Process

Engineering advances include new torque pitters and improved peeling methods—reduce product waste and aid in retention of flavor

In the large, compactly designed canning plant of Thornton Canning Co., Thornton, Calif.–where a wide variety of fruit and vegetable products are packed–equipment is being continuously improved or replaced, and new techniques applied.

Specific examples of these advances are the lines producing tomato pastes and the one packing cling peaches. The former has already been pin-pointed (Flowsheet, FE Jan., p. 102-105). And now the cling peach process is illustrated in the accompanying flowsheet.

FOR STORY BEHIND THIS FLOWSHEET—completely describing line's operations—see p. 52.

Operation begins with receipt of fruit in lug boxes, which are automatically dumped (2,000 per hr.) into washer–Point 1. Washed peaches are elevated to size grader–Point (2)–which separates them into three sizes.

Graded fruit is conveyed to the pitting line–Point (3)–comprising 56 Filper units arranged 7 on each side of 4 separate conveyor systems. Outstanding feature of these brand new pitters is the method of separating flesh from pits by twisting.

Flesh and pits fall onto conveyors that move them to shakers–Point (4)–where latter are separated and conveyed to waste. The peach halves are inspected, then go to the "cup-down" unit–Point (5)–that arranges them on a stainless mesh conveyor. This belt moves them into the improved lye peeler–Point (6)–where they pass under a curtain of hot alkali solution, through a steaming section and, finally, under water sprays.

Peeled halves are inspected, and size-graded, then fall onto an intricate conveyor system–Point (7)–which discharges to the nine final inspection belts. Finally, halves are packed in four can sizes on seven hand-pack fillers, syrup is added, cans are seamed, sterilized, cooled, labeled, and cased. After palletizing, cases are moved to storage.

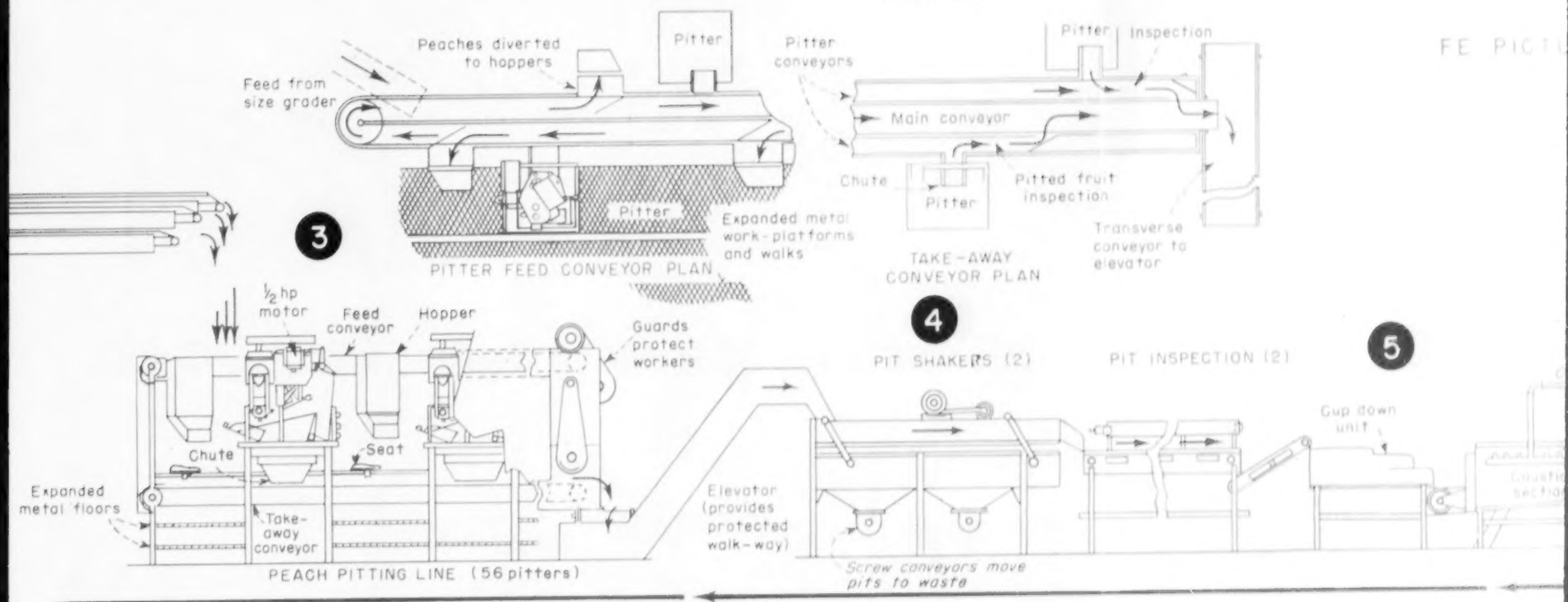
CHECKLIST OF EQUIPMENT

Lug box dumper, size grader for peach halves, *Benner & Nauman;* pitters, *Filper Corp.;* whole fruit size grader, pit shaker, hand-pack fillers, syrupers, exhausters, *Food Machinery Corp.;* Re-pitters, *Special Equipment Co.,* and *Fruit Mach. Co.;* cup-down unit, *Dudley Machinery Corp.;* peeler and cup-up unit, *Melrose Sheet Metal W'ks.;* slicers, *Abertoli Canning Machinery Co.;* continuous cookers & coolers, *Pacific Can Co.;* seamers, *Angelus Sanitary Can Mch. Co.*

FOOD ENGINEERING MAY 1956 Pages 104-107

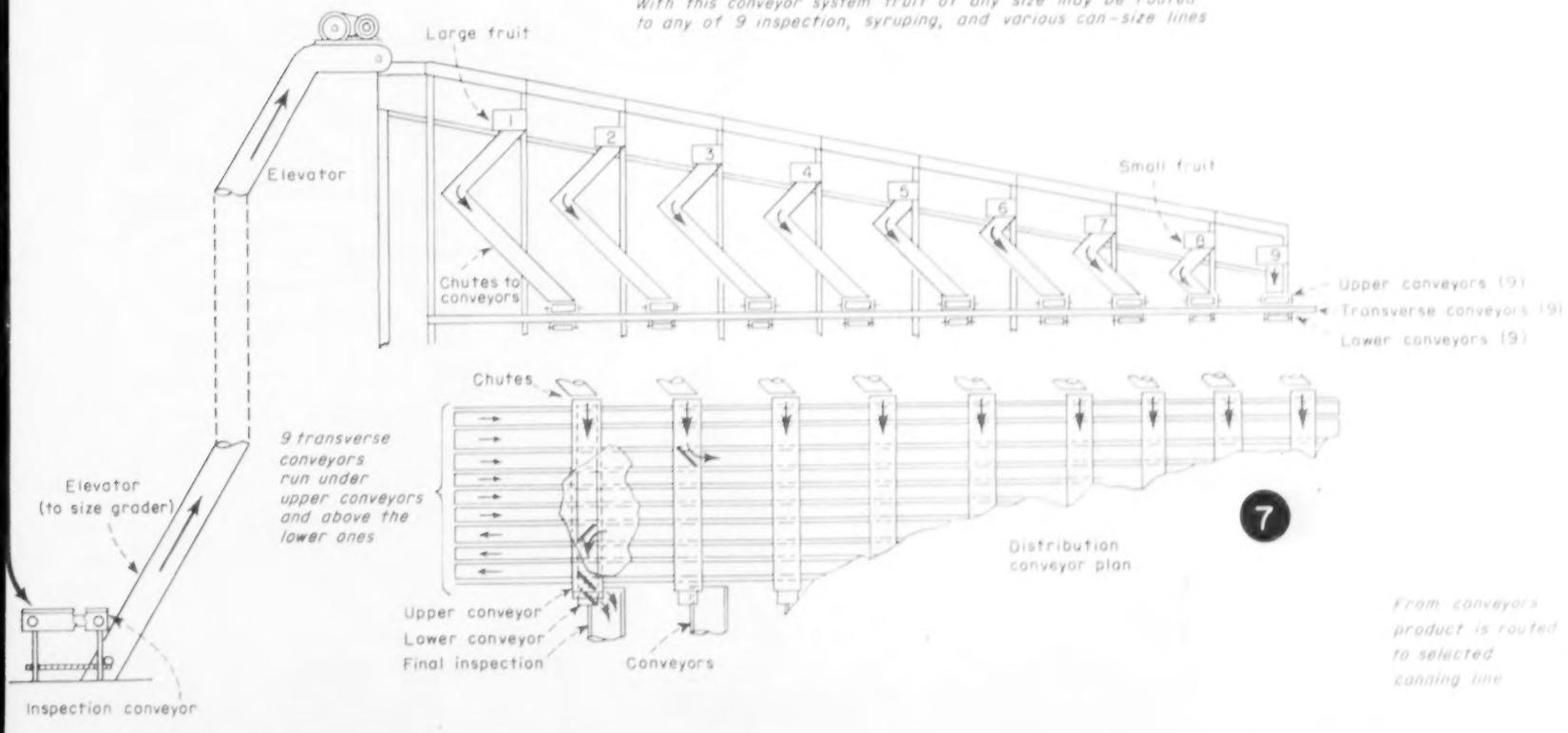
FINAL INSPECTION of halves before they are elevated to the hand-pack fillers, insures quality of canned peaches.

PITTING

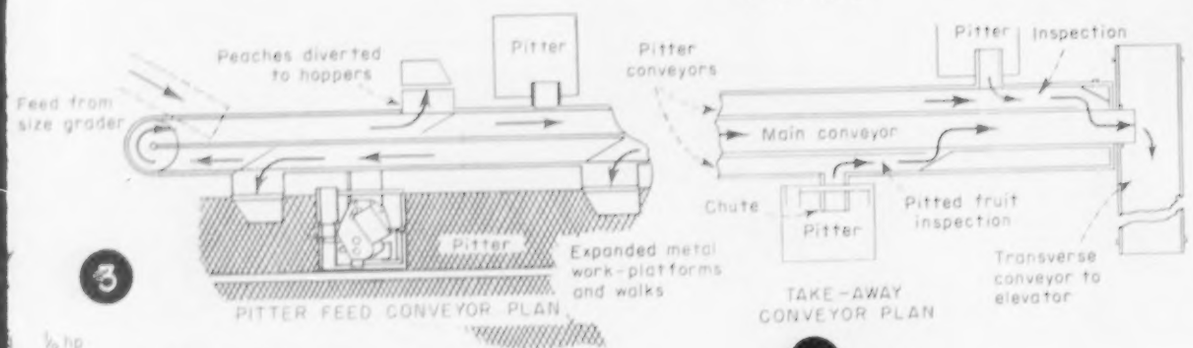


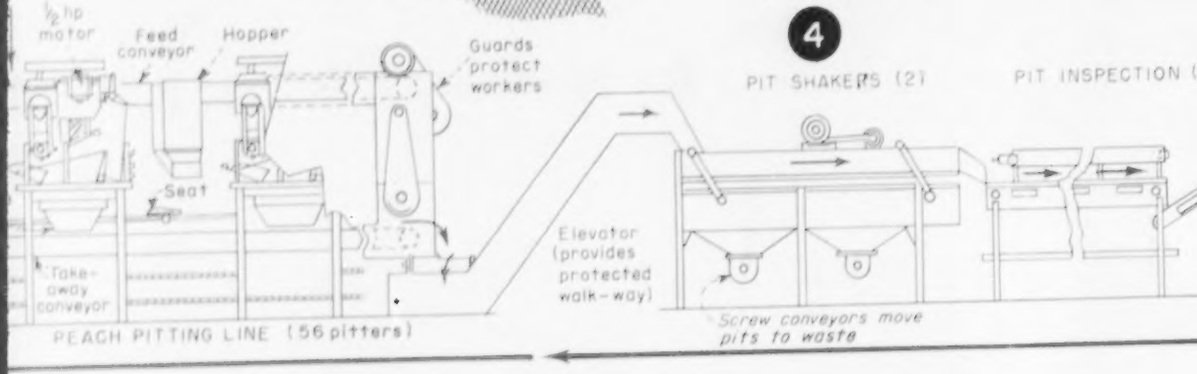
SIZE GRADER AND DISTRIBUTION CONVEYOR

With this conveyor system fruit of any size may be routed to any of 9 inspection, syruping, and various can-size lines



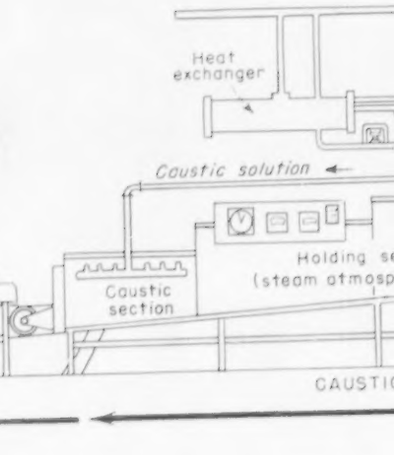
PITTING





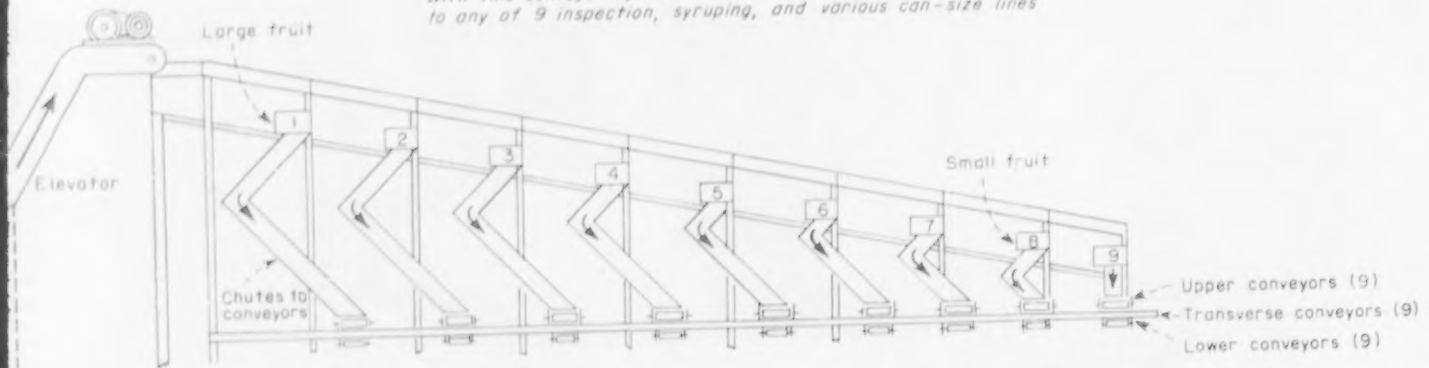
FE PICTURE FLOWSHE

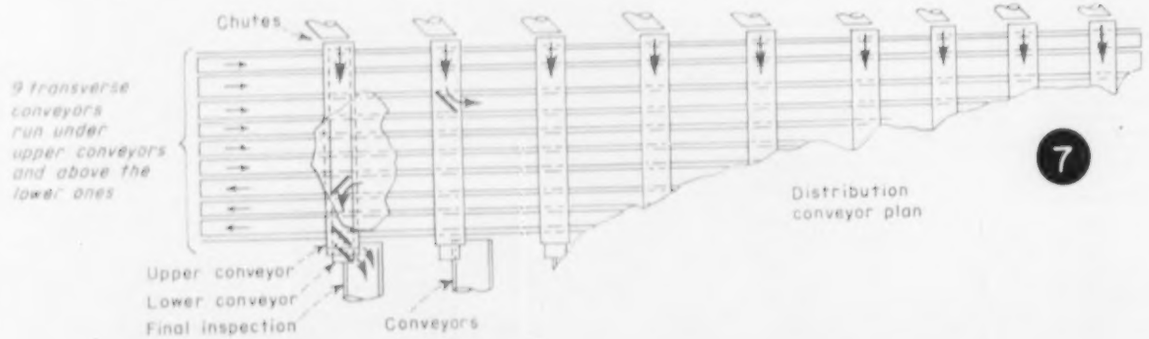
P



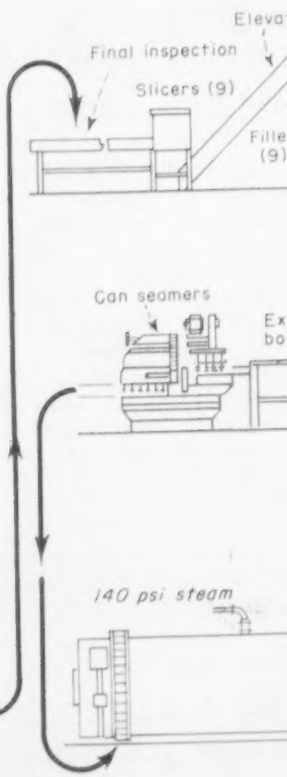
SIZE GRADER AND DISTRIBUTION CONVEYOR

With this conveyor system fruit of any size may be routed to any of 9 inspection, syruping, and various can-size lines



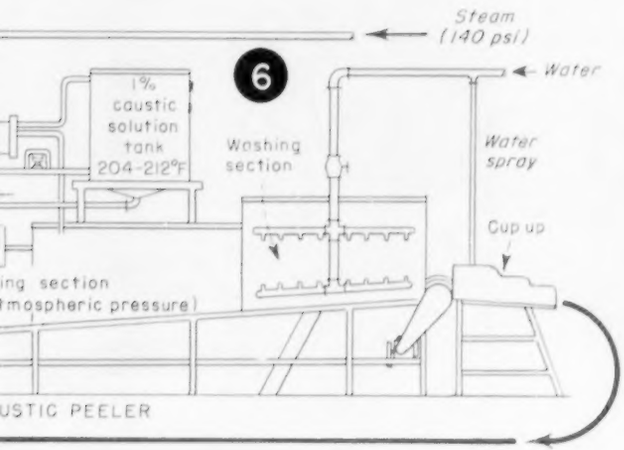


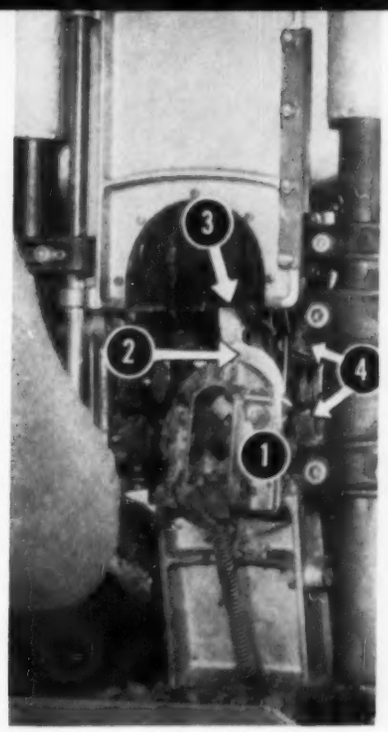
CANNIN



SHEET NO. 88

PEELING

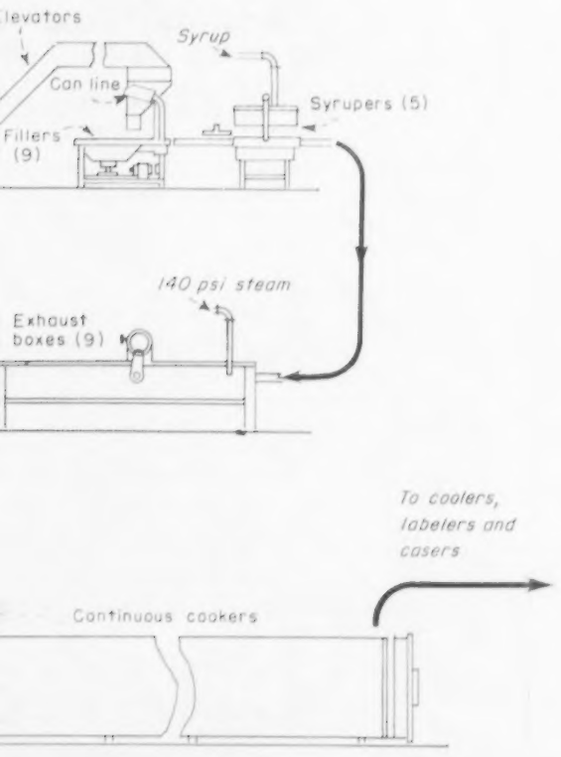




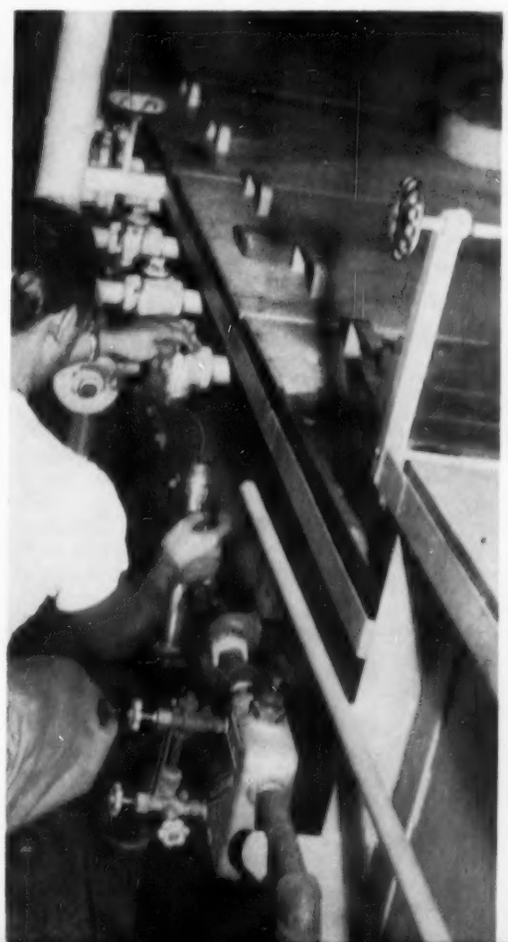
3 **PITTER** in action. Arm (1) delivers fruit (2) to knife (3). Rubber tipped fingers (4) close on halves, twist them from pit.

5 **CUP-DOWN** unit (left) arranges peach halves on stainless steel mesh conveyor so that hot caustic solution will not contact flesh of fruit as they travel through lye peeler (right).

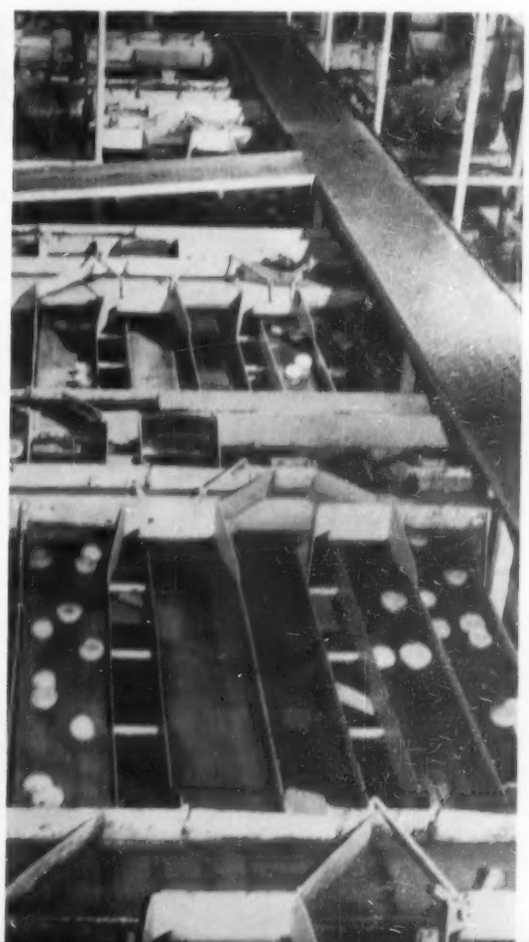
NING LINES



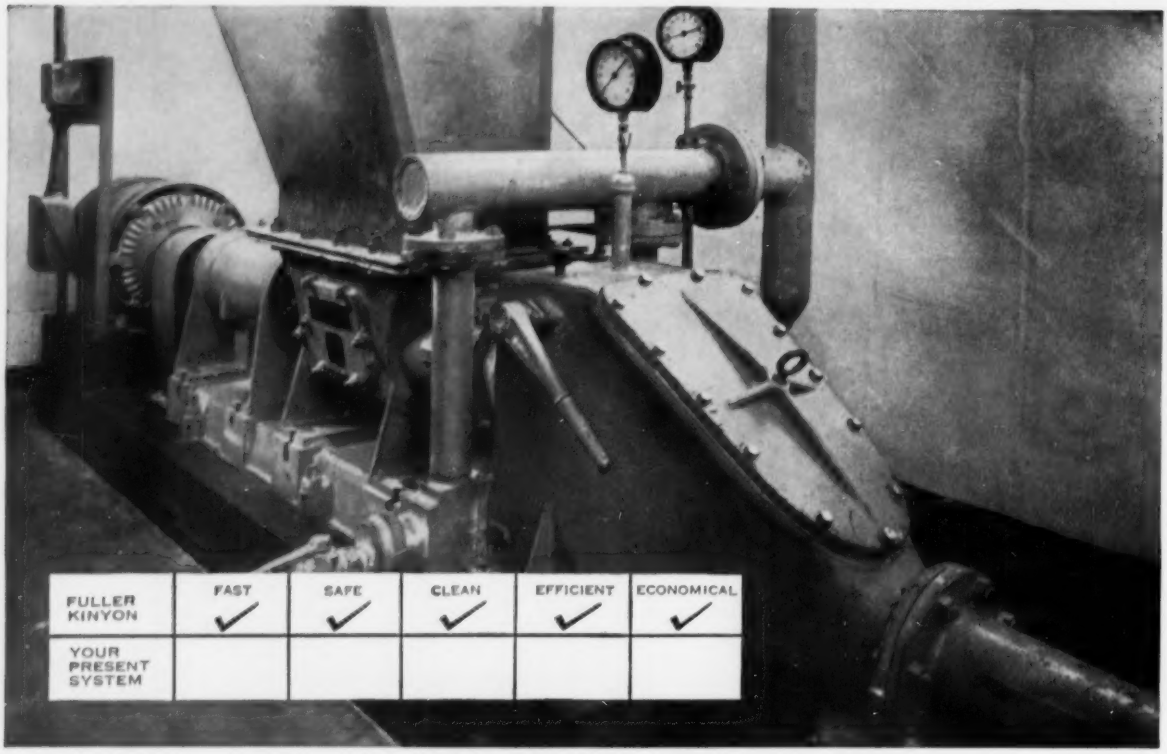
6 **CHECKS** determine dilution of caustic solution being recirculated through peeler (right).



7 **CONVEYOR** system (27 belts) distributes graded halves to final inspection lines.



How many can't you check . . .



Fuller-Kinyon pump conveying flash-dried starch to dextrine or starch bagging department at rate of 12,500 lb. an hour. Conveying distance 600 feet.

. . . against your present dry pulverized materials handling method?

If there's just one of these practical features that you *can't* claim, you can be sure that its lack is adding a substantial amount to your annual conveying costs. To move bulk Portland cement, pulverized coal, limestone dust, flue dust, fly ash, starch, pulverized phosphate rock or any other dry materials of similar consistency, a Fuller-Kinyon System designed specifically for your plant will provide the best combination of efficiency and economy available and also afford the "extras" of safety, speed and cleanliness.

A FULLER-KINYON SYSTEM:

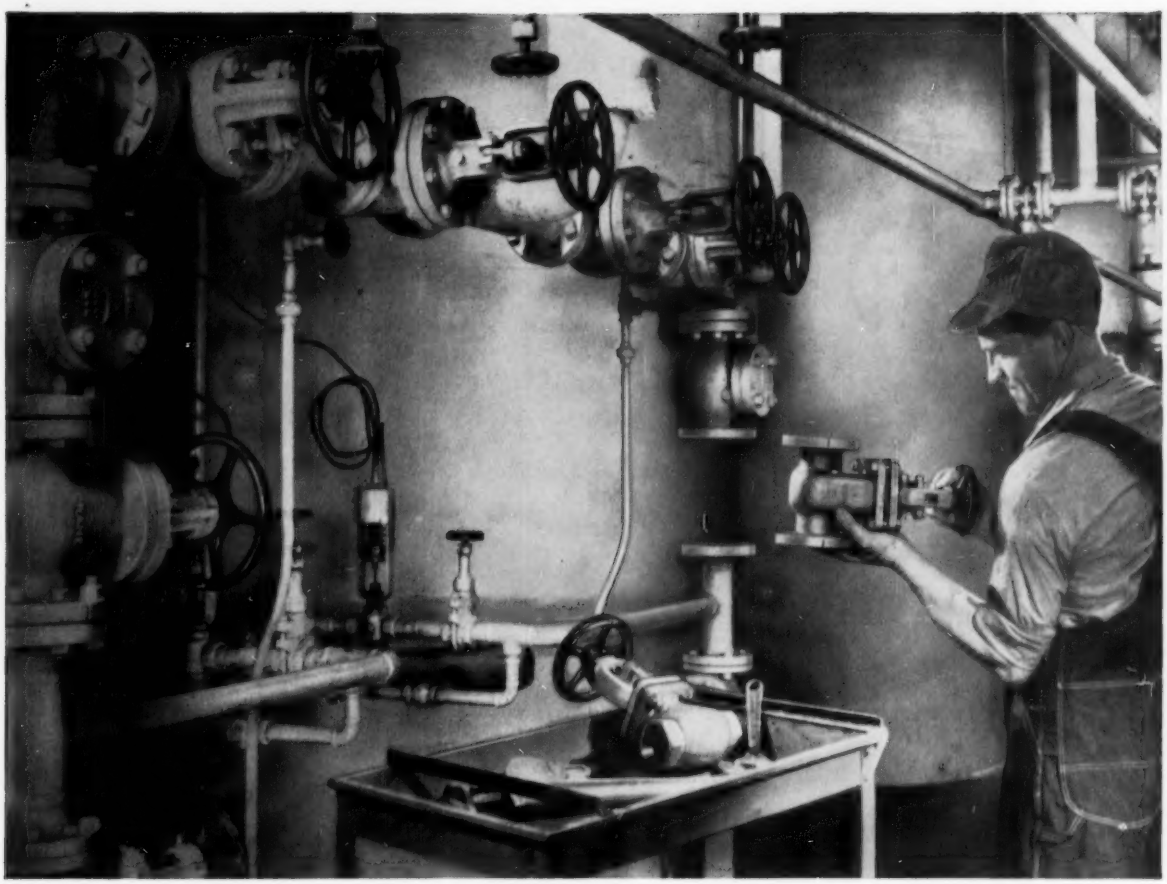
- *harnesses air to do the work
- *eliminates fire and explosion hazards
- *operates anywhere a pipeline can be run
- *entails no complicated or costly installation factors
- *reduces maintenance sharply
- *can be operated by one man
- *eliminates spillage—waste

Proof that these advantages have been long recognized is the fact that one or more Fuller-Kinyon Systems are serving in 98 per cent of the nation's cement mills as standard primary conveyors. Take a leaf from this service record. Get the facts as they apply to your plant and put Fuller's 30 years of pneumatic conveying experience to work for you.

P-163
3019

Fuller
. . . . pioneers in harnessing AIR

FULLER COMPANY
114 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Chicago · San Francisco · Los Angeles · Seattle · Kansas City · Birmingham



Corrosion meets match in Crane 18-8 SMo and Craneloy 20 valves

It's unanimous! These Crane valves for the process industries were *especially designed* of Crane alloys to cope with costly corrosion and to cut replacement costs.

The gate valves feature a simple, split-wedge disc construction which permits discs to rotate freely within guides and to seat tightly at all points on the seat perimeter. The free movement of the disc, plus uniform seating and unseating pressures, minimizes galling and seizing, reduces wear and allows smooth operation under all conditions.

Globe and angle valves now feature a modified plug-type disc that combines the advantages of the easier seating of the narrow ball-to-flat seat and the high resistance of the wider plug-type disc to corrosion, erosion and cutting. In addition, these valves offer a new swivel disc-stem connection that seats the disc squarely every time. Minimum clearance eliminates vibration.

These valves are available in 18-8 SMo and Craneloy 20 . . . in gate, globe, angle and check patterns . . . ½" to 6" . . . screwed or flanged ends. Rated 150 p.s.i. at 500° F.—230 p.s.i. at 100° F. *For more detailed information*, confer with your CRANE representative or write to the address below for the 12-page circular AD-2080.

Split-wedge disc gate.

Swivel disc globe.

Crane trunnion-mounted split-wedge disc combines the benefits of free rotation with uniform seat load pressure.

New swivel disc stem connection in globe and angle valves permits the disc to swivel freely on contact with seating surfaces.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

Standard Oil's Stan Nelson (left), with Federal Bakery men (l. to r.); E. L. Hostettler, general sales manager, C. F. Baumann, garage superintendent and Wendel Fish, general manager, inspects one of bakery's trucks that has 100,000 miles of service and yet has required no major maintenance.

It takes a lot of work to deliver a loaf of bread

Federal Bakery Co., Winona, Minn., makes it as easy as possible — uses only **STANOLUBE HD-M** *Motor Oil*

Federal Bakery Co., Winona, Minn., keeps close watch on maintenance costs, has one of industry's lowest cost-per-mile records. S. E. Nelson (left), Standard Oil automotive lubrication specialist, Arne Steivang (center) and Charles Baumann, Federal Bakery garage superintendent, confer about truck maintenance records. Helping customers with lubrication problems is something Stan Nelson is well qualified for. An engineer with a degree from the University of Minnesota and a graduate of Standard Oil Sales Engineering School, Stan has 8 years' experience. Customers find help from Stan Nelson pays off—*for them.*

Everyone expects bread to be delivered fresh and on time. The housewife makes no allowances for rugged delivery schedules, bad weather, tough roads. Federal Bakery Company makes fine bread and delivers it to Southeastern Minnesota and Western Wisconsin *on schedule* no matter what the weather. A good PM system and the use of STANOLUBE HD-M Motor Oil in all of the company's trucks are two of the big reasons why Federal gets the job done.

And getting the job done is not just good enough for Federal. The Federal fleet of 40 Ford units —F-1's to F-600's—has one of the lowest cost-per-mile records in the Quality Bakers of America membership. Federal Bakery trucks have as much as 100,000 miles without even the pan removed. Other units have 250,000 miles on the chassis with many, many more miles still to go.

This kind of performance from equipment is routine for Federal Bakery. Helping trucks deliver low cost-per-mile service is routine for STANOLUBE HD-M Motor Oil.

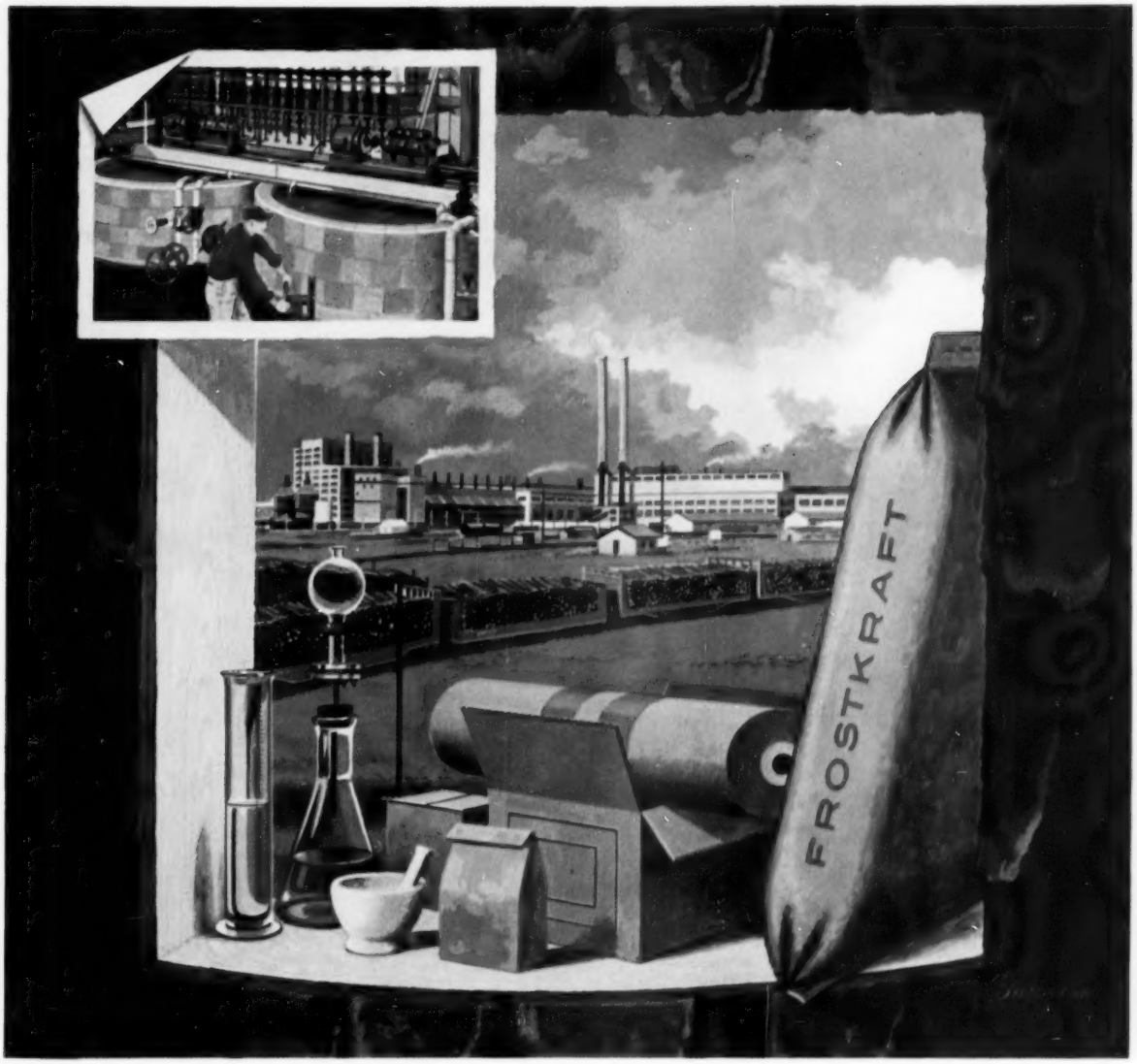
The hot engine, long haul of Federal's over-the-road units, or the short trip, low temperature, frequent idling service of street delivery units—it is all the same to STANOLUBE HD-M.

Handling extremes of service, no matter what it is—in diesel or gasoline equipment—is built into STANOLUBE HD-M. Its highest quality base stock and additive formula mean clean engine performance, no varnish, no sludge, no carbon-like deposits.

Find out more about STANOLUBE HD-M Motor Oil. Call your Standard Oil automotive lubrication specialist. There is one near you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)



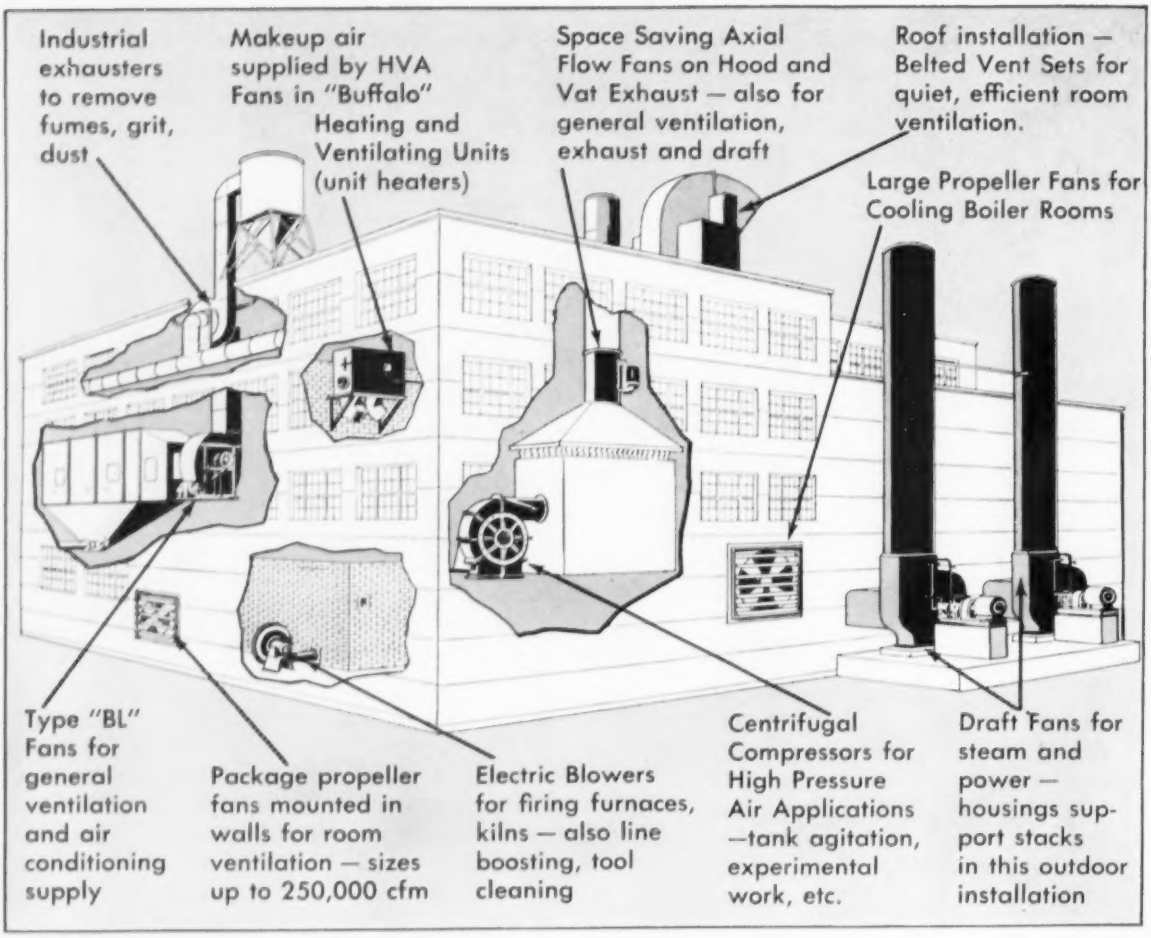
Tough-tempered *FROSTKRAFT* packaging

...better value through quality...better quality through efficiency
...efficiency through integration

FROSTKRAFT bags and corrugated containers deliver maximum dollar value because they are products of a highly efficient, completely integrated industrial operation. Result-conscious Olin Mathieson management controls every step of the manufacturing process... from perpetual forest reserves, to pulp-and-paper mill, to bag and container plants.

A call to your nearest FROSTKRAFT representative will focus Olin Mathieson's tremendous packaging know-how on your Kraft packaging program. Why not contact us today.

FROSTKRAFT
paper products
FOREST PRODUCTS DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
WEST MONROE, LOUISIANA


Industrial exhausters to remove fumes, grit, dust
Makeup air supplied by HVA Fans in "Buffalo" Heating and Ventilating Units (unit heaters)
Space Saving Axial Flow Fans on Hood and Vat Exhaust — also for general ventilation, exhaust and draft
Roof installation — Belted Vent Sets for quiet, efficient room ventilation.
Large Propeller Fans for Cooling Boiler Rooms
Type "BL" Fans for general ventilation and air conditioning supply
Package propeller fans mounted in walls for room ventilation — sizes up to 250,000 cfm
Electric Blowers for firing furnaces, kilns — also line boosting, tool cleaning
Centrifugal Compressors for High Pressure Air Applications —tank agitation, experimental work, etc.
Draft Fans for steam and power — housings support stacks in this outdoor installation

WHAT AIR JOBS DO YOU NEED DONE—EFFICIENTLY?

Above are some of the jobs our twelve basic types of fans are doing for plants everywhere. Air for comfort, air for combustion, air to move materials or remove impurities, air for pressure applications—these are ways in which "Buffalo" Fans are ready to put *your* air to work. And the same "Buffalo" engineering that gave the industry the FAN ENGINEERING HANDBOOK assures you peak performance in every fan. "Buffalo" representatives (factory-trained Graduate Engineers in all principal cities) are ready to recommend the right fan for any application. Call on "Buffalo" now for the "Q" Factor* of fan satisfaction.

**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

BUFFALO FORGE COMPANY

BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

A MESSAGE TO AMERICAN INDUSTRY • FIRST OF A SPECIAL SERIES

THE SHORTAGE OF SCIENTISTS AND ENGINEERS: *How Critical Is It?*

The United States is running into a serious shortage of scientists and engineers. There is no novelty in this observation. It has often been made in the last few years. And there has been mounting alarm about what this shortage may mean for both our national security and our prosperity.

There would be great novelty, however, if general agreement were attained on such important matters as the size of the shortage, the extent of the damage it threatens to inflict, and the best ways to eliminate it. The purpose of these editorials is not to provide this novelty, but to ventilate some of the key aspects of the shortage of scientists and engineers.

This first editorial in the series is designed to throw light on the over-all dimensions of the shortage. Others will be addressed to such questions as:

- How serious is the threat to our economic well-being and to our national security?
- What needs to be done to prevent the shortage from becoming critical?

Rise in Technical Manpower Has Been Rapid

The problem is *not* that we have been producing a small number of engineers and scientists. Indeed, the number has risen sharply. We now have a working force of more than 600,000 engineers, over twice as many as the 286,000 there were in 1940. And we have about 250,000 scientists (chemists, physicists, biologists, geologists, mathematicians, etc.), compared to only 92,000 in 1940. About one in 148 persons in the labor force of 1940 was a scientist or engineer; today the ratio is about one in every 80.

In research and development work, where highly creative scientific minds are required, there has been fully as rapid a rise in employment of scientists and engineers. Fewer than 90,000 were employed in research and development fifteen years ago; the total now exceeds 200,000.

. . . But Not Rapid Enough

Despite this rapid increase in the number of scientists and engineers—at a rate much faster than the increase in the labor force as a whole—the needs of industry, government and education for technically trained people have risen even more sharply.

The principal reason for this mounting demand is the prodigious growth of research in the last 15 years. From a total of only about $900 million spent on all types of research in 1941, the annual expenditure rose to over $5 billion by 1953 (the latest estimate available). Over two-thirds of the research is done by private industry, mostly to develop new and better products and to find new and better methods of production. Most of the rest is performed by the government, largely to develop improved and inevitably more complex scientific weapons.

One aircraft company has found from its own experience that it required 17,000 engineering manhours to develop a typical fighter plane in 1940. The requirement is now about 1.4 million engineering manhours. Development of the typical fighter plane of 1960 will require well over 2 million engineering manhours.

In this dramatic example, the need for engineering services for a basic piece of military equipment soared 80 times in 15 years. It is an indication

of why the demand for more and more technically trained men and women has outstripped even the imposing increase in scientific and engineering manpower of the last decade and a half.

Size of the Shortage

Exactly how great the gap is between the available supply of scientists and engineers and the number required, it is impossible to say. In some instances technical talent undoubtedly could be better used than it is now. And part of the shortage might "disappear" if higher salaries had to be paid. (These questions will be discussed in later editorials.) But informed estimates of the approximate size of the gap can be given.

● According to the best available information, from estimates by the Engineers' Joint Council and the U. S. Bureau of Labor Statistics, **the minimum need for engineers from graduating classes is 40,000 each year for the next ten years.** Last year we graduated only 23,000 engineers, just about enough to cover replacement needs without allowing for any expansion of the number of active engineers. Projections made by the U. S. Office of Education indicate that we shall probably not have a class of 40,000—the *current* annual requirement—until 1963.

● According to Dr. Howard Meyerhoff, executive director of the Scientific Manpower Commission, **there is now a shortage of about 20,000 scientists.** Last year the number of doctoral degrees in the natural sciences, almost a prerequisite for research work, was only 5,000. Dr. Meyerhoff estimates that the shortage of scientists will rise another 30,000 by 1960.

More Needed as Teachers

Not all of the graduates with scientific and engineering training, furthermore, will work as scientists and engineers—that is, by performing research and giving it practical application. Such training is now necessary in many sales and management positions. And more of our technically trained men and women must remain in educational institutions as teachers if the quality of engineering and scientific education is to be maintained. A survey in 1954-55 by the National Education Association showed that, out of 277 universities, state colleges and large private colleges, nearly one-third *already* had unfilled vacancies in engineering and three-fourths had vacancies in physical sciences.

The dimensions of the shortage of scientists and engineers can be summarized as follows: **Despite a substantial rise in the trained manpower available, the needs of industry, the government and education have risen still faster. The best information indicates that, on the basis of current and anticipated needs, our recent yearly rates of production of slightly over 20,000 engineers and about 5,000 PhD's in natural sciences could be doubled without closing the gap entirely.**

The disturbing implications of this shortage for our national security and our prosperity and some practical suggestions for eliminating it will be the subjects of subsequent editorials in this series.

This is one of a series of editorials prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

You ought to see the skeletons in our closet

We've got thousands of them and we are mighty careful to see that they don't rattle around and get lost

They are X-rays of what might be called the "bone structure" of an ACF-DURADOME tank car . . . actual pictures of the vital weldments which join together the heavy gauge steel.

The seams in ACF tank cars are butt welded inside and out . . . then X-rayed to assure perfect weldments throughout. These X-rays are part of the *permanent* record of every completed tank car which leaves our shops. They're your assurance that ACF builds the most rugged tank cars on the rails today.

Our job is leasing, selling and maintaining tank car fleets for industry. You'll find a nationwide network of Shippers' Car Line offices and repair shops ready to serve you. Our modern tank car service has been developed through decades of service to industry. Whether you prefer to lease or buy . . . contact your nearest Shippers' representative.

SHIPPERS SHPX CAR LINE

SHIPPERS' CAR LINE CORPORATION

A subsidiary of acf INDUSTRIES, Incorporated

30 Church Street, New York 7, N. Y.

CHICAGO, ILL. · HOUSTON, TEX. · SAN FRANCISCO, CAL. · MILTON, PA. · EAST ST. LOUIS, ILL. · SMACKOVER, ARK. · TULSA, OKLA. · NORTH KANSAS CITY, MO. · RED HOUSE, W.VA.

How many calories in a spoonful of sugar?
Feel "guilty" about your appetite?
Sugar can help you control it!
A timely report on...
The importance of sugar
...in family meals
...in reducing diets

It's your fight, too!

For over two years, ads like these have been appearing in leading newspapers and magazines.

They are being read by millions. Most important, they are being believed! Evidence is building up that they are building a better appreciation of sugar and the good foods and beverages that contain sugar.

This reassuring kind of advertising reinforces the healthy attitudes toward your products that have been built up over the years.

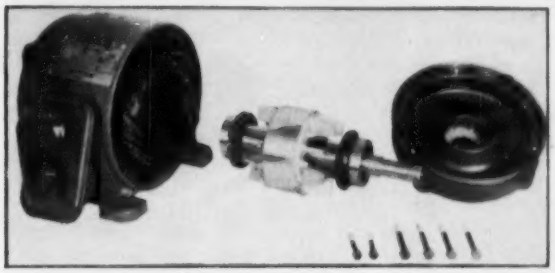
It is in direct opposition to the kind of scare copy and distortions of fact which do more to undermine confidence than to create sales.

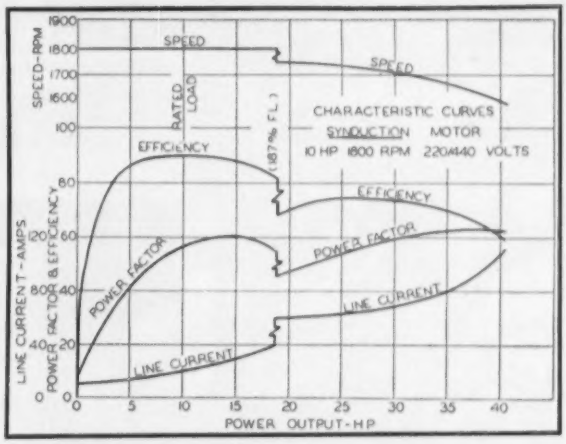
That's why Sugar's advertising campaign is fighting to set the record straight. Set it straight by exploding fallacies. Set it straight by emphasizing the positive benefits of sugar.

By doing so, we're protecting our interests —your interests—and the interests of millions of people who want the natural benefits of nature's own pure food sweetener.

SUGAR INFORMATION, INC., NEW YORK 5, NEW YORK

NEW EQUIPMENT & SUPPLIES





HYBRID SYNCHRONOUS MOTOR, employing simple die-cast rotor, eliminates brushes, slip rings, rotor windings, separate d.c. excitation, and special starting equipment. Right: Characteristic curves for 10-hp. unit show typical speed-control advantages.

New Type of Motor Permits Superior Speed Control

Industry-wide application is seen for a unique motor development—a variation of a synchronous reluctance machine that can be used effectively where:

1. **A motor must operate at constant speed.**
2. **Several units must run at fixed speed ratios.**
3. **Speed of one or several motors must be adjustable over a wide range with minimum variation at any speed setting.**

The meat-packing field has already provided a successful constant-speed application for the unit. In one installation, a motor-driven slicer had to complete a high-speed operation in a fixed time so that it could be synchronized with succeeding steps. Torque requirements varied because of change in size of material being cut.

Squirrel-cage or wound-rotor motors could not be used since their output speed is affected by load. But operating without speed variation, the new unit permitted coordination with the rest of the system.

And other applications are being explored.

• **Packaging:** Equipment manufacturers are investigating the machine for systems that will require several motors operating at fixed speed ratios.

• **Automation:** Possibilities are seen where there are definite limiting sequences in a continuous operation as in transfer lines of packaging and folding machinery, also in conveyors where speed control is essential.

• **Proportioning:** Positive-displacement metering pumps.

Called Synduction, the new motor is a hybrid that combines constant-speed characteristics of the synchronous machine with low first cost, rugged construction, and maintenance simplicity of an induction unit. It is built on integral horsepower frames in sizes from fractional up to and including 40 hp.

In operation, the reluctance unit accelerates as a squirrel-cage induction motor. After reaching synchronous speed it operates without slip from no-load to pull-out. Speed is constant in that range providing the supply frequency is constant. Beyond pull-out, slip is present and speed decreases as load increases.

Thus, speed is directly proportional to frequency and, up to pull-out, is independent of load and voltage. If frequency is varied motor speed changes in exactly the same ratio.

If several units operate from the same electrical source, speed ratio of one to that of any other cannot change. Varying the frequency changes the speed of each motor in proportion to the frequency change.

This motor is a synchronous machine in that it develops torque at synchronous speed, but it is not a power-factor correcting device. It operates with a lagging power factor, which at full load can reach 60% on 60-cycle units. By comparison, a power factor of 30-40% is usually the full-load maximum for conventional reluctance motors.

Because power-factor correction is not a deciding factor with small-size synchronous motors, this disadvantage is not considered important.

Finally, an electro-mechanical drive has been developed to supply variable frequency, which permits speed variation. Power from a constant-frequency a.c. source is supplied either to a salient-pole synchronous motor or to one of the new units, depending on size. This motor drives a variable-frequency alternator through a double-motion control drive (Texrope).

With this system, a single motor may power more than one alternator by use of a jack shaft and various take-off motion-control drives. — *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Circle 117A on Reader Service Card

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

Steel Drums Protected By Coating Process

A new drum-treating process reportedly gives 55-gal. steel units a conditioned protective surface that increases adherence and durability of paint surfaces. Furthermore, it offers a clean, dry inside surface.

Called Ja-Lizing, this treatment is especially recommended for drums containing clear and non-corrosive liquids, such as vegetable oils and fats, which must be free of contamination.

In a process similar to that given automobile bodies, metal washing and

chemical treatment are combined in spray equipment. It converts the steel surface to a non-metallic zinc phosphate coating, which is applied separately to shells, heads, and bottoms before assembly.

As a result, containers have a dust-free, non-metallic inner surface that is also: Chemically clean and grease-free inside and out; corrosion-inhibiting; protected by a non-conducting bond between bare metal and paint; and thoroughly dry.—*Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30.*

Circle 117B on Reader Service Card

Major Redesign Marks New Fork-Lift Trucks

Advanced design of this line of fork lifts offers innovations in control, operator safety and comfort, and ease of maintenance.

Gas models (Clarklift) are now available in capacities ranging from 2,000-5,000 lb. However, electric and gas units of higher capacity will be added shortly. They will offer as standard equipment a 12-v. electrical system, fully automatic transmission, emergency fuel tanks, foam rubber seats, and automotive controls.

Dimensioned for mobility and ease of control, trucks have steer wheels of the same diameter as front drive wheels. Distance from front axle to face of fork has been reduced by an average of 2¼ in. to permit stacking in narrow aisles. A long wheel base with short overall length plus weight distribution, which puts almost half the weight on the front axle, offer increased tractive power. Further, overall weight has been reduced.

Two chrome levers are mounted on the steering column—one controls direction, the other lift-lower and forward-reverse tilting. There is no clutch pedal. New engines give solid-tire models minimum full-load speed of 8 mph. and gradeability of 20-30%. Pneumatic-tire models have full-load speed of 12 mph., 26-33% gradeability.

Improved visibility, higher lift speeds, and elimination of sway and distortion are attributed to unit's new uprights and hydraulic system. Roller-mounted uprights are nested to increase vision, while position of lift chains does not interfere with visibility. Side-thrust rollers prevent separation of uprights and reduce lateral tipping of fork carriage when load is carried off-center.

The 2,000-psi. hydraulic system employs a special valve on the tilting system to eliminate vacuum in the back of the hydraulic cylinder, which would cause sway and loss of control of uprights.

Driver comfort is emphasized by a clear-through floor board that provides ample leg room and one-step mounting from either side. Attachment controls are located on dashboard near driver's right hand. A 4-inch adjustable foam rubber seat has a self-adjusting swivel back designed to fit a driver of any size. The wide brake pedal can be reached easily with either foot, while braking effort has been reduced 35%.

Self-adjusting brakes and all-model interchangeability of major components minimize maintenance. A device on the brakes automatically holds proper clearance between lining and drum every time brakes are applied. The adjustment ceases when lining is worn to a predetermined realigning point, and is indicated by pedal going to a lower position when depressed.

The only brake maintenance necessary is said to be replacement of lining about every 2 yr., depending on operation.—*Clark Equipment Co Battle Creek 14, Mich.*

Circle 118A on Reader Service Card

INDEX

Chemicals **139**
Briefs **140**
Applications **143**

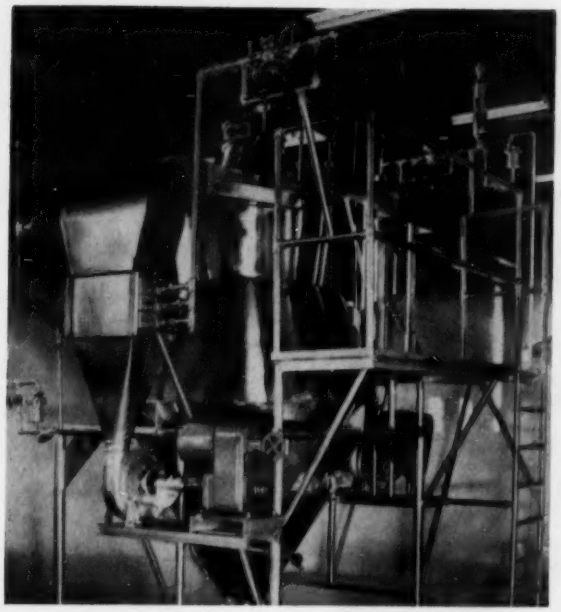
Speeds Quality Control On Production Lines

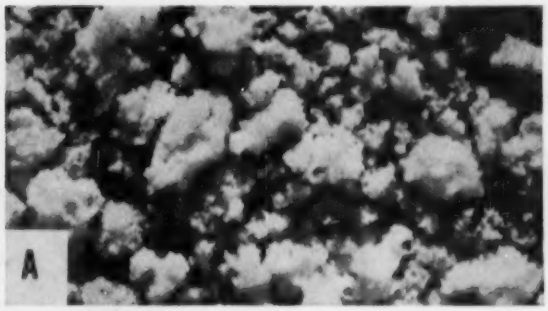
Simple, fast operating procedure is said to make this new refractometer especially useful as a quality-control tool on the production line.

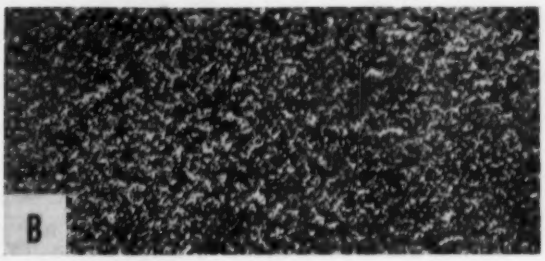
Designed for non-technical personnel, instrument (Abbe-3L) determines refractive index of liquids, dissolved solids, and some opaque solids —in 1 min. Loading the refractometer has been simplified by mounting the prism assembly within easy reach of the operator.

Samples are lighted by a built-on illuminator that swings into position. Readings, taken with a single eyepiece, are easily obtained because of internal illumination. Refractive-index range is 1.30-1.71, solids scale is 0—85%. Flash-light-type lamps are readily replaced, prisms are interchangeable.

Refractometer requires little field servicing and can be calibrated with an Allen wrench. Latter is inserted through an opening in the instrument body and turned until the reading corresponds to that of a glass test-piece.—*Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.*







Agglomerating Unit Makes Powdered Foods Instantly Water-Soluble

Action of this machine is said to overcome the problem of consumer sales resistance to powdered milks, cocoa, and other types of homogeneous blends and dry mixes that are not readily dispersed in water.

Advantages cited for the equipment (Instantizer) are minimum product deterioration and low operating cost. Production is 750 lb. per hr. of powder ready for packaging, based on operation with non-fat milk. Product can be handled directly from a drier or from storage, and operator training reportedly takes only a few hours.

Unit is designed to change powders to a form in which they can easily be reconstituted. Photo (A) is an enlargement of particles of spray-dried skim milk after processing. It shows marked clustering, in contrast to the unagglomerated particles of unprocessed powder (B).

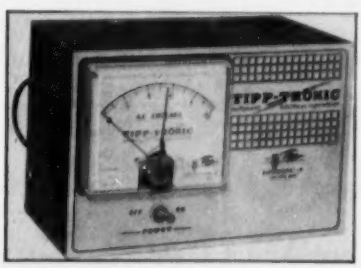
When powder, with particles bonded in fragile clusters, is mixed with water, moisture penetrates each cluster to break the bond. Original characteristics of the product—natural flavor, body, and potential shelf life—are maintained through control of process time and temperature.

In operation, food powder of good quality enters the unit at the top through a feeder that flares the powder into a thin stream. Then it is contacted by steam from jets that surface-moisten the particles, causing them to become slightly adhesive. Moisture pickup is controlled at about 1%.

As powder continues downward through the machine, a mildly heated air stream creates turbulence which results in particle agglomeration. At the same time, moisture is removed and particles are cemented into clusters. Product is then conveyed to a sifter for sizing, after which it is ready for packaging.

As a result of this processing, bulk density of non-fat milk powder decreases about 50% to about 35 g. per 100 cc. Unit uses about 100 lb. of steam per hr., and compressed air at 60-80 psi.—*Blaw-Knox Co., Dairy Equipment Div., Mora, Minn.*

Circle 119A on Reader Service Card



Safeguards Conveyors Against Overloads

This automatic safety controller provides warning to prevent damage from abnormal load conditions on electrically-driven conveyors.

The new electro-mechanical device (Tipp-Tronic) eliminates need for shear pins and slip clutches in guarding against accidental jam-ups. It also provides motor protection.

A self-contained package combining fuses, circuit breakers, ammeters, and tong testers, unit instantly stops the conveyor at any predetermined load setting. Not affected by line-voltage variations, it measures and acts upon variations from normal load over a wide range, and may also be set up to give warning of impending trouble.

Resetting of the controller is manual on most systems.—*Tipp Mfg. Co. Tipp City, Ohio*

Circle 119B on Reader Service Card

Automatic Liquid Sampler Boosts Quality Control

Uniformity of liquid products may now be more readily controlled through composite samples accurately taken by an automatic sampling device.

Designated L/W, it consists of an electric timer that regularly activates a spring valve to take a cross-section sample of flowing liquid. Sample flows through a plastic tube to a sealed container that handles a day's run.

Timer is set to operate the sampler 10 times per min., but frequency can be varied. An adjusting screw controls sample volume, which ranges to

Now — A Revolutionary NEW Steam Trap!

INSTALL IT — FORGET IT!

ACTUAL SIZE

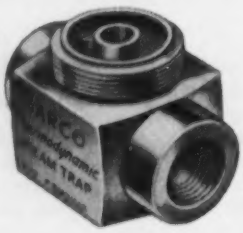
SO RUGGED **SO SIMPLE**

this steam trap practically eliminates maintenance

1. A CAP

2. A DISC

3. A BODY



That's all!

Major advance in trap design!

Imagine a steam trap machined from a solid block of stainless steel. A trap with only 3 parts...cap, disc and body...and not even a valve-closing mechanism — the kinetic energy of steam closes the valve and ONLY the TD uses this new operating principle.

That's the revolutionary new Sarco type TD. It has only one moving part...a hardened SOLID stainless steel disc. And it is not affected by superheat, water-hammer, corrosive condensate. That's why we can say INSTALL IT—FORGET IT!

Use the SAME trap for 10-600 psi...for light or heavy loads ...without seat or valve change or other adjustments. Closes tight on no load—no steam waste.

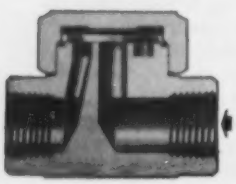
Ask for a 60 day trial installation of Sarco TD trap and strainer...write for bulletin 257. Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

2190-B

SARCO

Only Sarco Makes All 5 Types

That's why Sarco can give impartial advice on proper steam trap selection.

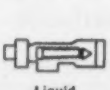


SIMPLICITY ITSELF
No valve-closing mechanisms to wear or stick. No critical clearances to choke. No gaskets to leak. Only moving part a SOLID stainless steel disc.

Thermodynamic Steam Traps

Thermostatic Steam Traps

Float Thermostatic Steam Traps

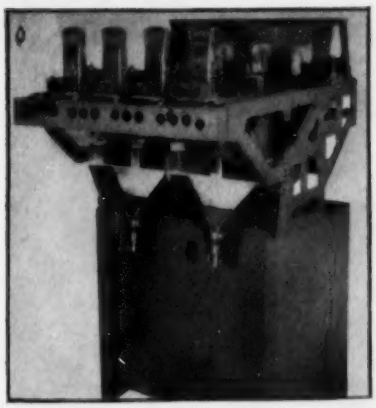


Liquid Expansion Steam Traps

Camlift Bucket Steam Traps

150 cc. per min. Units for 110 or 220v. adapt to either standard or sanitary lines from 1-4 in.—*Langsenkamp-Wheeler Brass Works, Inc., Dairy Supply Div., Indianapolis 3, Ind.*

Circle 119C on Reader Service Card



Automatic Net-Weight Unit Has Triple-Vibrator Feed

Shown above is the 4-head model of a new line of automatic scale-feed machines available with two to six scales. With new triple-vibrator feed, it offers even distribution of material in filling bags, cartons, jars, or cans.

Called Automatic Net Weight, units' feed throughs supply bulk and dribble troughs, controlled by a balance chute. Flow in the bulk trough is stopped just short of exact weight by scale contacts.

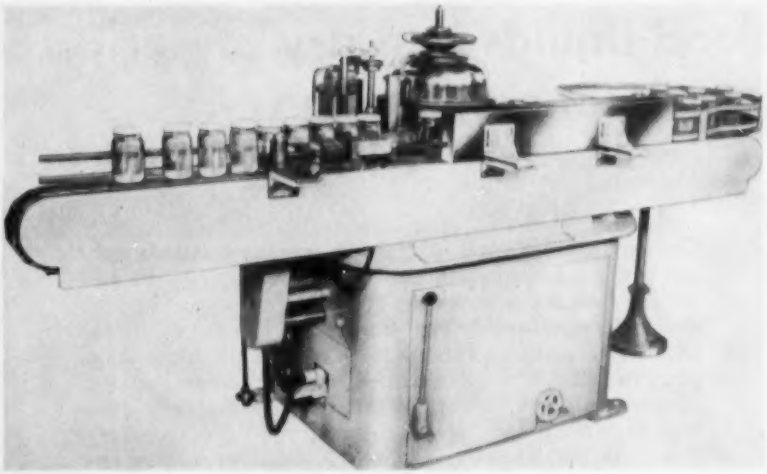
Micrometer-like settings on a self-locking poise are graduated in ⅛-oz. increments. Scales provide tolerances to ⅛ oz. with small products and to one piece plus in larger items. Equipped with checkweight indicators, entire scale assembly is located above the feed for access and cleanliness.

All parts contacting the product are of stainless steel or aluminum.—*Haysen Mfg. Co., Sheboygan, Wis.*

Circle 121A on Reader Service Card

OTHER DEPARTMENTS Featured in This Issue

Practical Ideas	page 5
Letters to the Editor	99
Editorials	102
New Packages & Products	150
Advances in Technology	153
Questions & Answers	183
Useful New Books	192
Keeping Up With the Field	197
Recent Inventions	209
Men and Companies	212
Just Off the Press	218



Suction Unit Labels Round Bottles at 165/Min.

This automatic unit, which combines suction labeling with non-stop rotary operation, also offers: A circulating glue supply, micro-glue control, shockless bottle feeding, rotary-discharge table, variable-speed control, and complete changeover (bottle and label) in 25 min.

Known as Pony 165, it takes any stable round bottle of ½-3½ in. dia. at 60-165 per min. Maximum label size is 5½ in. wide by 5 in. high; minimum, 1⅛ in. wide by ½ in. high.

The circulating glue system permits automatic and thorough mixing of glue, which eliminates need for twin rollers or scraper bars. Also it ends streaky gluing due to dirt or hardened glue. Suction extracts labels from the magazine and hold them while glue is applied independently. This reportedly prevents label slippage, eliminates glue seepage, promotes accurate registration, and releases skilled workers for other duties.

In operation, bottles enter by conveyor and a feed screw respaces them. Labels are held in an oscillating magazine, which moves in against the suction cylinder. Latter receives labels and, as it rotates, presents them to the glue roll.

Next, glued label is brought directly opposite the bottle and engages it. Simultaneously, a timed vacuum release breaks suction on the cylinder. Labeled bottle then rolls between a running belt and a fixed compressible wall, where pressure secures the label. —*New Jersey Machine Corp., Hoboken, N. J.*

Circle 121B on Reader Service Card

Candy-Handling System Keeps Operators Supplied

This conveyor system reportedly handles 28,000 pieces of candy per hour. Each girl cups and packs about 2,000 pieces per hour on the belt.

In operation, one or two box-setup operators supply the line with box bottoms and separators if required. Covers travel adjacent to box bottoms

Actual laboratory pre-tests prove you can . . .

Blend liquids into dry materials fast, in one operation . . . without lumps

Getting perfect dispersions of liquids into dry materials without lumping has almost always entailed extra steps for pulverizing, mulling or screening, etc.

But P-K's new *Liquid-Feed** Twin Shell Blender eliminates those extra, costly operations. Now, in a one batch operation, you can achieve complete dispersion of liquids in a matter of minutes. Blender is charged through large dust-tight openings that allow easy access to shell interior for cleaning. Complete Liquid-Feed assembly is quickly removed by means of a spring loaded mechanism.

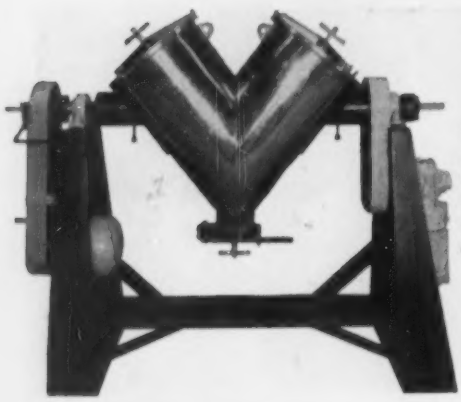
The Liquid-Feed blender is simple in concept. Liquid flows from a feeder tube within the bar onto a revolving distributing disc. Centrifugal force flings a fine spray outward. Dry materials tumbling in the Twin Shell receive liquid in controlled amounts at all times. The wire cage, spinning at high speed, prevents the formation of lumps before or after liquid is introduced.

Results? More perfect blends, in a fraction of time previously required. Want proof? P-K's Process Division maintains a complete lab to assure accurate, predetermined performance to meet your liquid-feed blending requirements. P-K will conduct, without obligation, laboratory test-blends with your materials.

Experimental testing will provide operational procedure and scale-up data. All test reports are held in strict confidence when desired, and, whenever convenient, testing may be supervised or witnessed by your personnel. P-K will submit complete factual test results, including samples of test-blends. Write direct to our Research Department.

The Patterson-Kelley Co., Inc.,
1550 Hanson Street, East Stroudsburg, Penna.

*patented and patents pending

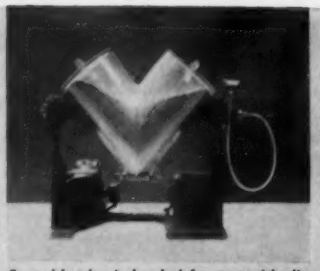


This production model is in stainless steel. Standard liquid-feed twin shell blenders are available in most commercial metals. Sizes range from 3 to 50 cu. ft. working capacity.

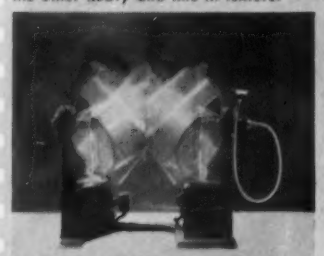
PATTERSON KELLEY

Chemical and Process Division

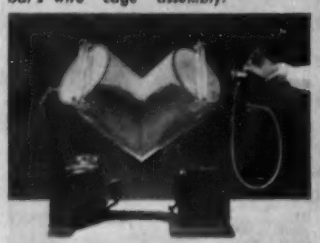
Twin Shell Blenders • Autoclaves • Pilot Plants • Heat Exchangers
Ribbon and Double Cone Blenders • Lever Lock Doors



8 qt. blender is loaded for test with dissimilar materials, one lumpy and light, the other heavy and fine in texture.



Complete uniformity is obtained in a few minutes by dry blending. Lumps are broken up by fast-spinning intensifier bar's wire "cage" assembly.



Liquids are then introduced into the dry blend during rotation by gravity-feed. Distributing disc disperses liquid evenly. Wire cage prevents clumping.

Average blending time is approximately 15 minutes to obtain perfect liquid-feed mix. One step operation eliminates pulverizing, mulling and screening.

Discharging is easy. Stainless steel liquid-feed assembly ejects instantly, rinses in seconds. Seconds more to wipe clean the smooth, easy-to-get-at interior.

to the point of completed pack, where cover is attached.

Candy is delivered on trays from back of conveyor on multiple-deck-wheel storage racks. Each operator has a supply of 24 full trays. Empties are returned on top shelf to supply operator in back of conveyor.

Built onto the front of conveyor is a holding bar on which small containers of paper cups are hooked for quick accessibility to packing operator's hand. Also, a foot rest under conveyor provides working comfort when operator is in a sitting position.—*Conveyor Systems, Inc., 325 S. California Ave., Chicago.*

Circle 121C on Reader Service Card

Sweeps Congested Areas At 80,000 Sq. Ft./Hr.

This rider-type power sweeper is specially designed for aisles and congested areas where larger units cannot be used. Applications include plants, garages, and warehouses.

Known as Model 50, it is 60 in. long, without side brush, and turns in about its own length. Traveling at speeds of 2-8 mph., unit cleans a 28-in. path (40 in. with optional side brush) and reportedly sweeps up to 80,000 sq. ft. per hr.

Efficient operation is attributed to a combined brush and vacuum system that uses high-volume air flow. The brush, revolving in a vacuum compartment, hurls dirt and litter forward into a removable 4½-cu. ft. hopper. At the same time, an 11-in. fan draws dust and fine dirt from brush compartment up into a fabric bag.

Driven like an auto, unit's clutch, brake, and accelerator pedals are foot-operated. Sweeper is powered by a 6.8-hp. air-cooled engine, and has front-wheel drive, two-speed transmission.—*G. H. Tennant Co., 2566 N. Second St., Minneapolis 11, Minn.*

Circle 123A on Reader Service Card

New Drop-Frame Chassis Boosts Working Space

Especially designed for multi-stop retail milk delivery, this truck (SA-140) provides a new drop-frame chassis that increases driver's working area. Another model (SA-120) with same design and performance characteristics is offered to the bakery field.

The milk truck is available with 115 or 134-in. wheel base in a wide range of bodies (Metroette) 7 ft. or 9½ ft. long. Capacity of the 7-ft. body is 65 square-bottle cases, which stack 3 tiers high on adjustable angle-iron racks.

A new automatic transmission (Metro-Matic) is furnished as optional equipment. It has a "parking" position on the shifting quadrant that acts as an emergency brake for most stop and start operations. This parking brake is in addition to the hand-operated emergency brake.

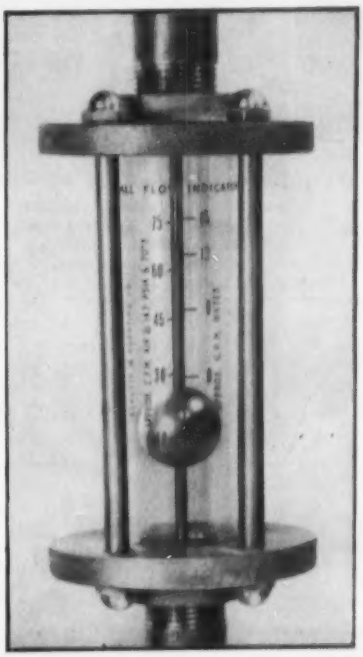
Truck's additional working area, which can be used for load space or to facilitate delivery, was achieved by extending driver's compartment rearward by as much as 16 in. on 115-in. wheel base models, and up to 19 in. on 134-in. units. Steering wheel and column are now in a more vertical position. This provides easier access for loading and unloading from the left.

A forward-positioned windshield permits installing an optional platform base to the right of driver's compartment. This space can be used for a refrigerated cabinet or as load area for five additional cases. And with 68 in. from floor to top of windshield, driver has improved visibility from both standing and sitting positions. The 115-in. model turns in a 22-ft. radius.

All bodies are offered with standard 25-in. wide sliding side doors and optional 28-in. folding doors. Double rear doors with 38-in. opening are standard, while units without rear doors or with 67½-in. double rear doors are optional.

Insulated and refrigerated bodies are also available. With 4 in. of insulation, they are wide enough for five cases of square bottles across the width.—*International Harvester Co., 180 N. Michigan Ave., Chicago 1.*

Circle 123B on Reader Service Card



Dual Scale Permits Gaging Of Water and Air Flow

This ball-type flow indicator, which provides a dual scale for approximate measurements of water flow in gpm. and air flow in cfm., is termed inexpensive but sturdily built.

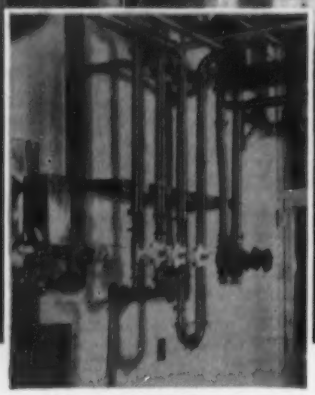
Flow is indicated by the ball which travels on a guide rod in a tapered glass tube. Water or air flowing from the bottom inlet exerts force on the ball, causing it to rise as flow increases.

Unit is recommended for flow from

TRI-CLAMP®

Stainless Steel Fittings and Valves assure superior product quality

Tri-Clover "cleaned-in-place" TRI-CLAMP lines are used for all movement of syrup into and out of these tanks in the syrup storage room of one of the country's largest bottlers.

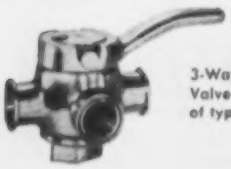


Recirculation cleaning pumps and lines are connected with TRI-CLAMP Fittings at this end of the syrup storage room.

TRI-CLAMP Snap-Action Spring Clamp, with toggle locking device securely attached.

TRI-CLAMP Tee available in 1"; 1½", 2", 2½", 3" and 4" sizes.

TRI-CLAMP 90 degree Sweep Ell available in all sizes.



TRI-CLAMP 3-Way Lift Type Plug Valve—complete range of types and sizes.

Maintaining the constant high quality of your bottled product means continued customer satisfaction and repeat order business. Follow the lead of progressive bottlers who are modernizing their plants by installing Tri-Clover's gleaming Stainless Steel TRI-CLAMP Fittings and Valves.

TRI-CLAMP Fittings employ a new idea in sanitary fitting design and fabrication. At the flick of the wrist you can assemble or disassemble a positive, sanitary, leak-tight joint. Combining this time and money saving feature with continued trouble-free fitting life and substantial savings in original cost adds up to more profit for your investment dollar.

Our engineering staff, employing many years of specialized experience and thorough know-how in liquid handling will work with you for a sure and economical solution to your processing line problems.

LADISH CO.

Tri-Clover Division

Kenosha Wisconsin

TRI-CLOVER

5256

remember this—Tri-Clover is your one dependable source for Sanitary Fittings, Valves, Pumps, Tubing and Allied Specialties, for both "cleaned-in-place" and "take-down" lines.

See your nearest
TRI-CLOVER DISTRIBUTOR
Export Dept., 8 S. Michigan Ave., Chicago, U.S.A.
Cable TRICLO

one direction only—bottom to top in vertical pipe lines, and when observation from any direction is desired. Made of bronze, indicator is available in ¼ through 2-in. pipe-connection sizes.—*Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.*

Circle 123C on Reader Service Card

Cotton Swab Sanitizes Hard-to-Reach Spots

With this cotton swab, maintenance men quickly and easily apply residual-type insecticides to hard-to-reach overhead places—pipes, fixtures, and drop cords—where flying insects roost at night in food plants.

The long-handled brush is made of a cotton twisted-in-wire crook (like a shepherd's), which confines the chemical to a given spot without spray or spattering. Swab also serves to remove dust and dirt.—*Fuller Brush Co., Industrial Div., Hartford 2, Conn.*

Circle 125A on Reader Service Card

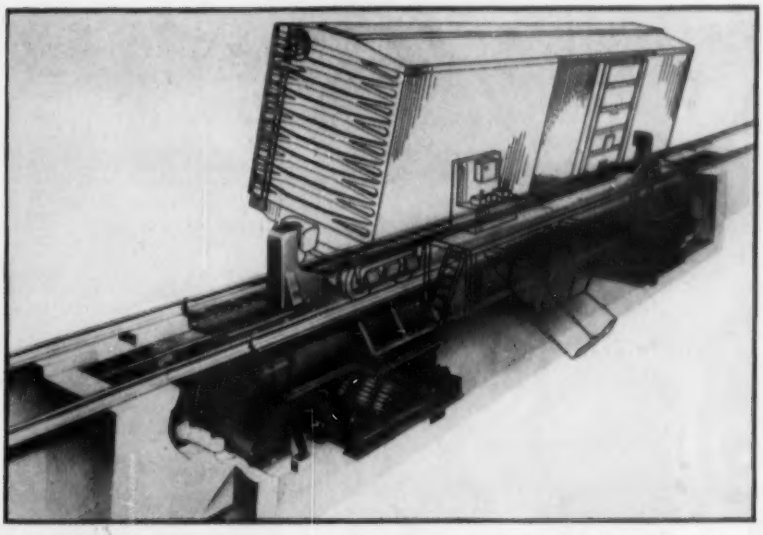
X-Rays Control Weight Of Extruded Dough

X-rays are now being used to weigh and control the thickness of sheet dough.

A non-contact gage (XactRay) employs an X-ray beam to measure the weight per sq. in. of dough just beyond the gage on the sheeter. This location offers a measuring precision of ± 1%, which can readily be used to control the weight of the sheet.

Rays do not contaminate the product or alter food values, and they are not radioactive. — *Industrial Gauges Corp., Englewood, N. J.*

Circle 125B on Reader Service Card



Oscillating Unit Unloads Bulk Material at 4 Cars/Hr.

Grain and other free-flowing bulk materials may now be emptied from railroad boxcars by one man at 4 car loads per hr.

Employed is a new oscillating unit (Kar-Flo) that takes a standard railroad boxcar, weighing up to 150,000 lb. loaded, and locks it on a steel structure. Then a rocking motion of only 3 in. at the ends of the car empties the load without injuring the car. Entire unit fits in a pit slightly over 7 ft. deep.

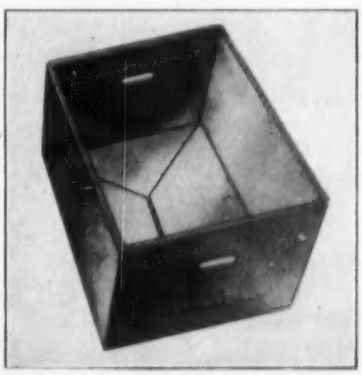
Most of the unloader is out of sight. Visible portion consists of a pair of rails mounted on a platform next to a receiving hopper, and an operator's platform with control center. The rail furthest from operator's platform is 8 in. higher than the nearer one, which produces a necessary 8-deg. side tilt toward receiving hopper. Approach rails slope gradually and approximate the bank of a standard railroad curve.

When a car is positioned, two hydraulically-operated end clamps rise from between the rails and move towards the ends of the car. They quickly center it and lock it to the platform to prevent endwise movement. Then, car door on unloading side is opened and inner door removed. Locks on platform are released and the drive is started by pushbutton.

Rotation of counterweights produces an oscillating motion of 140 strokes per min. Rocker arms convert this into a controlled-path motion which is amplified by spring assemblies. This rocking produces a conveying action that simultaneously moves material from both ends of the car towards the center. Because of car's side tilt, contents flow continuously through the door into a receiving hopper below.

A 25-hp. motor powers the main drive, while a 15-hp. hydraulic system operates platform locks and car clamps. Car platform weighs about 30 tons and has 236-in. wide-flange I-beams reinforced with gussets and X-bracings. It is designed for passage of switch engines and loaded cars.—*Link-Belt Co., 307 N. Michigan Ave., Chicago.*

Circle 125C on Reader Service Card



Frozen-Food Delivery Box Flattens for Easy Storage

A collapsible corrugated container of one-piece design is seen increasing the efficiency of frozen-food delivery.

Named "Miracle Box", it can be opened for use in seconds, then stored flat to save space on the truck's return trip. No stitching, stapling, or taping is required either for setting up or flattening.

Important, too, is double-wall con-

Efficient combination—Jamison Super Freezer Vestibule Door with FROSTOP assures minimum cold loss, frost-free doors.

Carnation Company demonstrates...

JAMISON Super Freezer Doors with FROSTOP prevent icing . . . save refrigeration

At the Carnation Company's new ice cream freezing plant in Oakland, California, 7 Jamison Super Freezer Doors with FROSTOP provide these vital advantages:

- Ice-free doors—FROSTOP assures easy opening and tight closure.
- Refrigeration Economy—fast-closing Jamison Vestibule Unit speeds traffic, keeps cold loss to a minimum.
- Faster Handling—Jamison Passing Door expedites loading, means less handling.

Solve *your* cold storage door problem efficiently and economically by taking advantage of Jamison Technical Service. Write today to Jamison Cold Storage Door Co., Hagerstown, Md., U.S.A.

On the move—Jamison Passing Door speeds high volume handling of ice cream from —30° storage to delivery truck.

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

More JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.

Insulation Contractor: PLANT ASBESTOS CO., Oakland, Calif.; *General Contractor:* JOHN F. TULLOCH CO., Oakland, Calif.

struction which offers a stacking strength in excess of 500 lb. Boxes have snug-fitting covers and convenient carrying holes.—*The Paige Co., 114 E. 32nd St., New York City 16.*

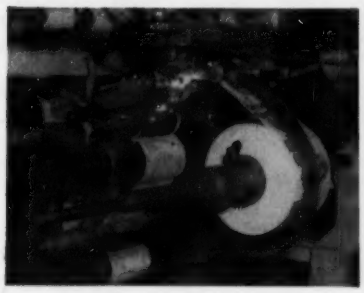
Circle 125D on Reader Service Card

Smaller Continuous Mixer For Production, Research

Designed for small-plant production and pilot-plant research on a variety of materials, this continuous automatic mixer (Oakes) offers capacities up to 1,000 lb. per hr., depending on the product.

Known as Model 8-M, it can be used for all products handled by maker's larger units—such as cake batters, and biscuit and candy marshmallow.—*E. T. Oakes Corp., Commack Rd., Islip, L. I., N. Y.*

Circle 127A on Reader Service Card



Bread-Wrapping Device Aids Baker, Consumer

Loose, tangled bands on packaged bread, which are a problem for both baker and consumer, may be eliminated by a new wrapping-machine attachment. However, it has not yet been perfected for automatic production lines.

Known as Bandmaster, it welds a specially-coated band to cellophane to yield a single wrap. Designed for American wrapping machines only, unit (center in photo) laminates the band to either side of the cellophane, thus permitting bands to be placed either on inside or outside of package. Bands range from 2-7 in. wide.

Where applicable, attachment offers the baker reduced rewraps, airtight bottom seals, and a more stable package. Advantage to the consumer is that he may readily remove slices and replace them by easily reclosing the package, thus preventing unnecessary waste.—*Rap-In-Wax Paper Co., 150 26th Ave., S.E., Minneapolis 14.*

Circle 127B on Reader Service Card

Thermal Efficiency Cited for Versatile Insulation

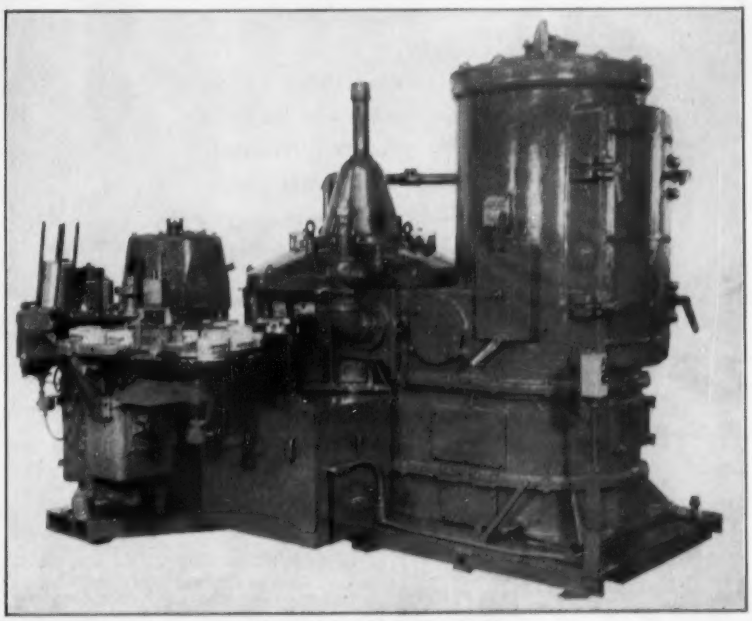
Designed for use at 50-250 F., this new pipe insulation with white universal jacket is offered for cold- and hot-water lines, and those carrying low-pressure steam.

Product consists of ½ in. fine-fibered insulation (Fiberglas), and a jacket of bleached, creped kraft paper laminated to aluminum foil. For installation on hot lines (left in photo), metal bands or stapling is recommended. On cold lines, insulation is applied by use of a white vapor-barrier lap adhesive (right).

Made in two equal sections for easy, economical installation, this insulation is light, dimensionally stable, and resistant to rot. Its "k" value averages 0.24 Btu at 75-deg. mean temperature, and the aluminum foil provides an effective vapor barrier.

Outer surface presents a pleasing appearance and, although no additional finish is necessary, the jacket may be painted. Sizes are ¼-12 in. for iron pipe and ½-4⅛ in. od. for copper tubing. It is made in 36-in. lengths.—*Owens-Corning Fiberglas Corp, Toledo 1, Ohio.*

Circle 127C on Reader Service Card



Coffee Cans Vacuum-Closed at 120 Per Min.

To meet today's production pace, this new closing machine seals vacuum coffee cans at 120 per min. Designed as a complete unit (500-1RV), it automatically feeds cans and covers, marks, clinches, vacuumizes, and double seams the can. Closer handles cans ranging from 2⅞-7 in. in height, 202-502 in dia. Sealed top and bottom valves guard against loss of vacuum through leakage. Machine weighs 18,540 lb., requires floor space of 109x118 in.—*American Can Co., 100 Park Ave., New York City.*

Circle 127D on Reader Service Card

IT TOOK MORE THAN AN EGGSHELL . . .

to settle this coffee-making problem

Time was when smart housewives dropped an eggshell in the pot to keep coffee grounds collected at the bottom. But the advent of modern spray drying methods has produced the "instant" beverage and made the old coffee pot just a memory.

Ducon Cyclone TYPE SD

Today, efficiency engineered Ducon Cyclone Collectors help to assure success for the coffee processor's secret of solubility. This maintenance-free equipment is providing uninterrupted service with a high degree of recovery, plus quality control for all types of spray drying applications. Minimizing particle breakage, the unit not only collects valuable fines but returns them as part of the marketable product. Like all Ducon Collectors, it is a result of the kind of engineering which has made Ducon "the name" in dust control.

There is a Ducon unit for every dust collecting problem. Send today for descriptive literature.

the name in dust control

Canadian Branch: THE DUCON COMPANY of CANADA, Ltd.
275 James Street North, HAMILTON, ONTARIO

THE Ducon COMPANY

147 EAST SECOND STREET, MINEOLA, N.Y. • Sales Representatives in Principal Cities

Designers and Manufacturers of Dust Control Equipment Exclusively

CYCLONES • CENTRIFUGAL WASH COLLECTORS • TUBULAR CLOTH FILTERS • DUST VALVES

Equipment & Supplies

Explosion-Proof Cleaner Offers Easy Handling

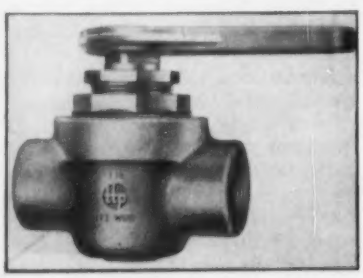
Lightweight, ruggedness, and ease of handling are advantages cited for new explosion-proof, wet- or dry-pick-up vacuum cleaner.

Approved for use in atmospheres containing flour, starch, or grain dust, unit (Model 315) employes a ⅞ hp., a.c.-d.c. totally enclosed motor. A cast-aluminum hood fits over the aluminum motor housing.

The fabric air filter is easily cleaned by brushing off dry dust, or it may be scrubbed under running water. Filter need not be removed or changed for either wet or dry pickup.

Cleaner is available in two sizes: 6 gal. wet, ⅜ bu. dry; and 10 gal., 1¼ bu. dry.—*Hild Floor Machine Co., 740 W. Washington Blvd., Chicago 6.*

Circle 128A on Reader Service Card



Self-Lubricated Plug Valve Now Offered in PVC

Reportedly the first "self-lubricated" plug valve to be injection molded of polyvinyl chloride (PVC), this unit is designed to reduce replacement cost and downtime, and minimize purging.

Teflon bearing buttons on the plug

FOR THE TOPS IN TASTE . . . for assured stability, flavor quality and strength, trade experience confirms the fact that soft drinks and summer beverage powders can be made better and more economically with FRITZSCHE'S TRUER, LIVELIER, MORE CONCENTRATED LIQUID FLAVORINGS. Remember: *Your product is* ONLY *as good as its* FLAVOR!

For useful information on this or other food or beverage flavoring needs, write our Flavor Division, Dept. FE.

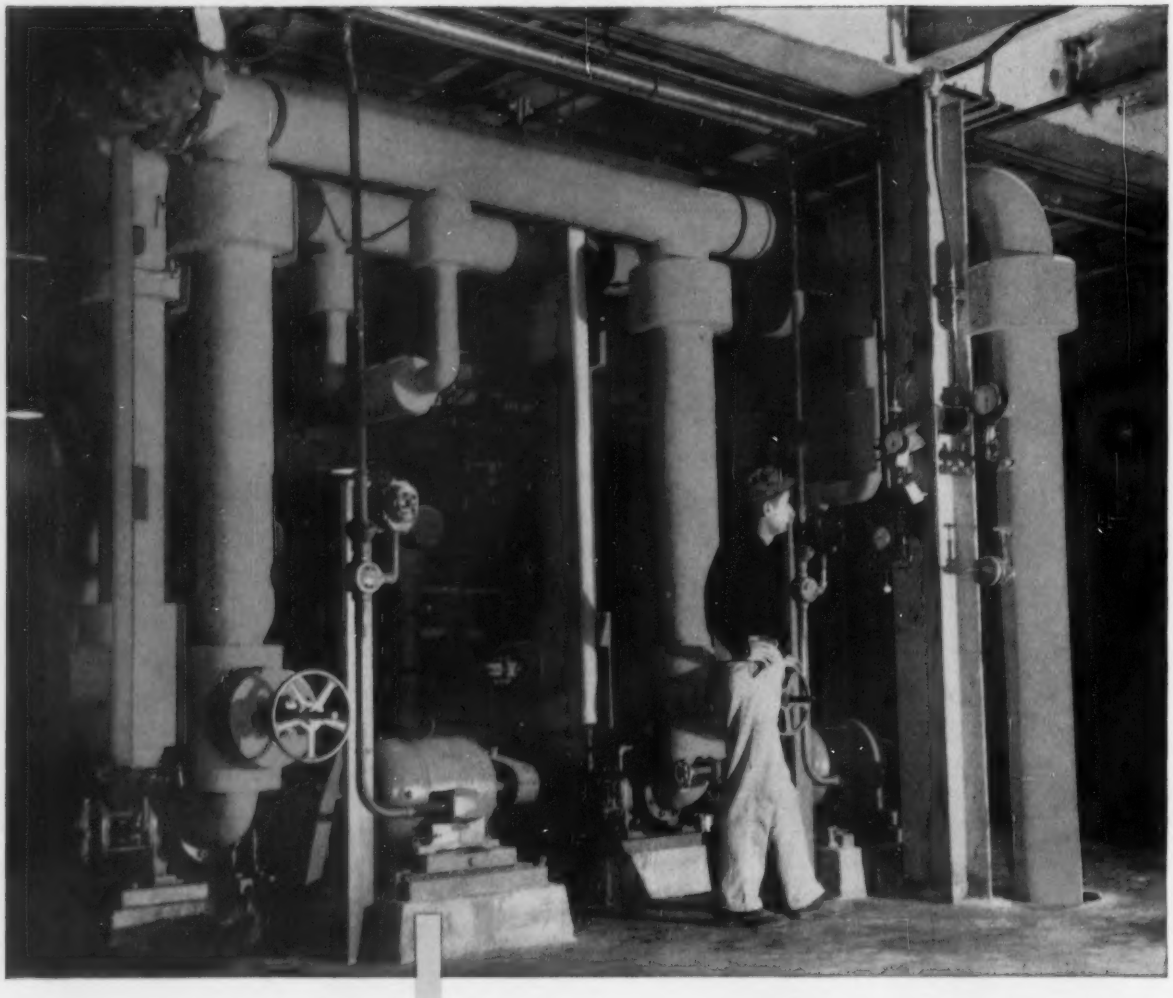
FRITZSCHE *Established* 1871

Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, Montreal and *Toronto, Canada and *Mexico, D. F. FACTORY: Clifton, N. J.

For more data, circle this page number on card at back → 129



Specify GUSTIN gb BACON SNAP*ON *for good and fitting reasons*

Plant piping takes on this trim, tailored look — and in record time — when you insulate with G-B Snap*On, the one-piece molded pipe insulation of fine glass fibers. From ¾" through 33" IPS and in 3' and 6' sections depending on pipe size. With just a pocket knife and a stock of Snap*On in nesting sizes, *anyone* can make easy work of the once-tedious job of insulating bends, valves and other fittings.

To fully understand why this material saves so much time and money on fittings and straight runs you need only handle a 6-foot section of Snap*On. It's flexible, yet resilient. It's feather-light, yet tough. It's almost impossible to damage, yet easy to cut with a knife. And to these obvious advantages, you can add such unseen benefits as *permanence* and the *highest thermal efficiency of any pipe insulation on the market.*

Next time you have hot or cold piping to insulate, call your nearby distributor, listed in the Yellow Pages under "G-B Insulations." In the meantime, write today for our new 8-page brochure with full details on "the first all-new pipe insulation in 60 years."

GUSTIN-BACON *Manufacturing Company* GUSTIN gb BACON

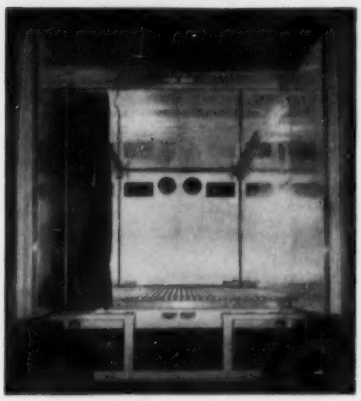
Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Railroad gaskets and supplies.

272 W. 10th St., Kansas City, Mo.

provide the self-lubrication. A straight-through port enables unimpeded flow, wear adjustments, positive closing, and self-indicating port positions. A nub on the bottom can be tapped for inserting a drain plug. Valve comes with threaded ends or with socket-type ends for solvent welding.

At present, units are available in 1, 1½, and 2-in. sizes to match pipe of corresponding nominal size. They may also be used with ½, ¾, and 1½-in. piping by employing bushings.—*Tube Turns Plastics, Inc., 2929 Magazine St., Louisville 11, Ky.*

Circle 128B on Reader Service Card



Partitioned Van Provides Compartments at 0, 40F.

A sliding partition that separates the freezing compartment from the cold section of this refrigerated van permits hauling of frozen foods and produce in the same unit.

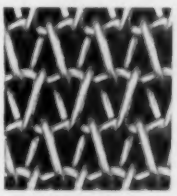
The 34-ft. van is made of aluminum, inside and out, to combine high thermal conductivity with weight saving for larger payloads. Temperature in trailer's front compartment can be held at 0; 40F. in rear space.

Partition may be moved as much as 12 ft.—6 ft. forward of center or 6 ft. backward. It slides on an overhead rail and two side tracks. Latter are attached to the walls, rather than set into them, to permit maximum thickness of insulation. Trailer contents are protected with 6 in. of insulation, and an aluminum ventilated floor extends the length of the van.

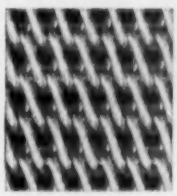
Unit has two doors, one at the rear for back compartment, the other in the side for front compartment. A sliding nylon curtain at each door keeps refrigerated air inside (and warm air out) when door is opened.—*Kingham Trailer Co., 15th & Hill, Louisville, Ky.*

Circle 131A on Reader Service Card

How to select WIRE MESH CONVEYOR BELTS for Continuous FOOD PROCESSING

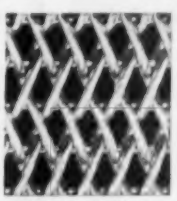


BALANCED—High tensile strength, low ultimate cost belting for operation up to 1300°F. Resists distortion. Designed for straight travel.



DUPLEX—Compact structure of great density provides high tensile strength. The close mesh provides smooth surface for carrying small products such as peas, pelletized feed.

GRATEX—Close spirals retain the advantages of Balanced weave, while producing a semi-closed mesh and adding strength. For cold, medium and some high temperature applications.



DOUBLE-BALANCED—A widely used weave, combining open mesh of Balanced weave with strength of Gratex. For cold, medium and some high temperature applications such as freezing and baking.

As you know, wire mesh conveyor belts are widely used for combining movement with processing in many continuous food processing operations—washing, blanching, freezing, baking, etc.—largely because of the need for increased operating efficiency and improved sanitation in handling.

However, there is no single type of belt construction suitable for all food processing operations. Some require rather fine mesh for handling such products as peas or cut vegetables; some high resistance to the corrosive attack of food acids and salt; others must be constructed for high temperature or sub-zero service in baking or freezing. That's why Cambridge has nine basic weaves available in any metal or alloy. The four shown here are the most widely used in food processing.

There are several factors that generally influence selection of weave, mesh size and metal or alloy from which the belt will be woven. Among them are: size, shape and consistency of the product to be handled; temperatures to which belt will be subjected; presence of wet or corrosive conditions. Even after these have been decided, overall belt construction must be designed to meet individual requirements—type of drive, selvage, support and special surface attachments must be selected.

You can see, then, that designing for continuous food processing with wire mesh conveyor belts is not a simple "nuts and bolts" job. Ramifications build up rapidly to demand the service of a specialist. That's why Cambridge maintains a staff of competent Field Engineers to help you select the Wire Mesh Conveyor Belt to make your installation most efficient. You can rely on the experience of these engineers to specify just the right belt for you. In addition, they are thoroughly familiar with basic conveyor design. For the name of your nearest Cambridge Field Engineer, look under "Belting, Mechanical" in your classified telephone book. Or, write direct. Also ask for 130-page Reference Manual of specifications and design information.

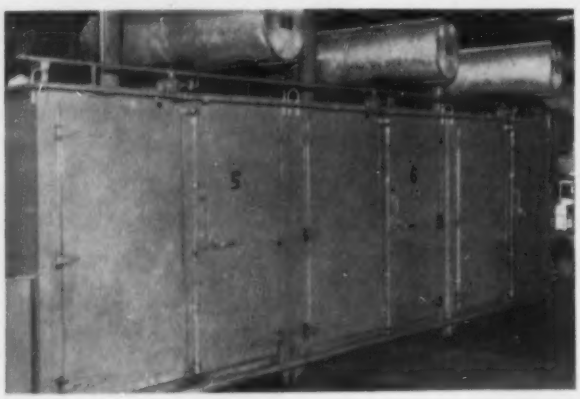
THE CAMBRIDGE WIRE CLOTH COMPANY, DEPT. Q, CAMBRIDGE 5, MARYLAND.

Remember this about
FREEZING

AMERIO
DOUBLE CONTACT
PRESSURE PLATE FREEZERS
(U. S. Pat. No. 2,608,069 Canadian Pat. No. 494,746)

Do the Best Quick Freezing Job

AMERIO INSTALLATION • PHILLIPS PACKING CO.



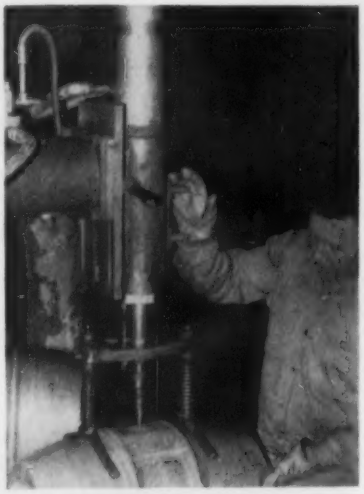
PERFORMANCE PROVEN — PROFIT PRODUCER —
MOST ECONOMICAL OPERATION —
FLAVOR RETENTION — FLAT UNIFORM PACKAGES

Designed for Ammonia, Brine or Freon Refrigerants

Amerio
Contact Plate Freezers Inc.
Union City, N.J.
"It's the Contacts that Count"

Send For
Illustrated
Brochure

Equipment & Supplies

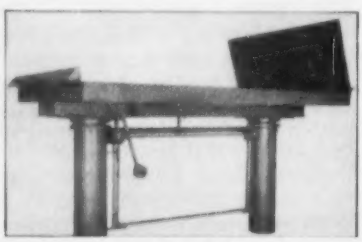


Air Drill De-Bungs Kegs At 400 Per Hour

Fast gaining brewery acceptance over the time-consuming hammer-and-chisel method of de-bunging kegs is a new automatic air drill that does the job at 400 per hr.

Called "Airfeedrill", here's how it works: As barrels roll down a conveyor, operator positions the bung directly below the unit. He pushes a button and tapered drill enters bung at predetermined speed. Clamps hold barrel firmly in place. Bung splits and falls apart as drilling continues.—*Keller Tool Div., Gardner-Denver Co., Grand Haven, Mich.*

Circle 132A on Reader Service Card



Platform Lift Rapidly Rises To Vehicle-Loading Level

Loading time for trucks and rail cars may safely be cut with use of this two-post hydraulic platform lift for loads of 6,000-20,000 lb.

At 2 ft. per sec., unit automatically rises or lowers (without inching) to bridge the gap between truck and platform. After loading, it returns to the dock. When lift (Load-O-Matic) goes above dock level, a barrier automatically locks across end of platform.

Loading-dock model has a 30-in.

Build Up Your Impulse Sales

Almost half of the shoppers at the frozen food display make their choice by impulse. You can increase your share of this "found" business by using the wrap that has beauty to attract sales and durability to keep looking attractive. This new wrap contains A-C* POLYETHYLENE, a tough, easy-to-handle polymer.

All types of wrapped packages will benefit from the use of high-gloss wrappers coated with A-C POLYETHYLENE-wax combinations. The glossy finish and luxurious feel of these lower-cost paper wrappers is amazing, and yet the cost is as much as 45% less than other glossy materials. Why pay premium prices for gloss when these super-gloss wraps are now available?

Write for more information on A-C POLYETHYLENE-wax coated wraps today.

*Trade-mark

Allied Chemical

A-C* Polyethylene

SEMET-SOLVAY PETROCHEMICAL DIVISION
Allied Chemical & Dye Corporation
Room 581
40 Rector Street, New York 6, N. Y.

Please send me information on A-C POLYETHYLENE blends and the name of converters who can supply me.

Name_____

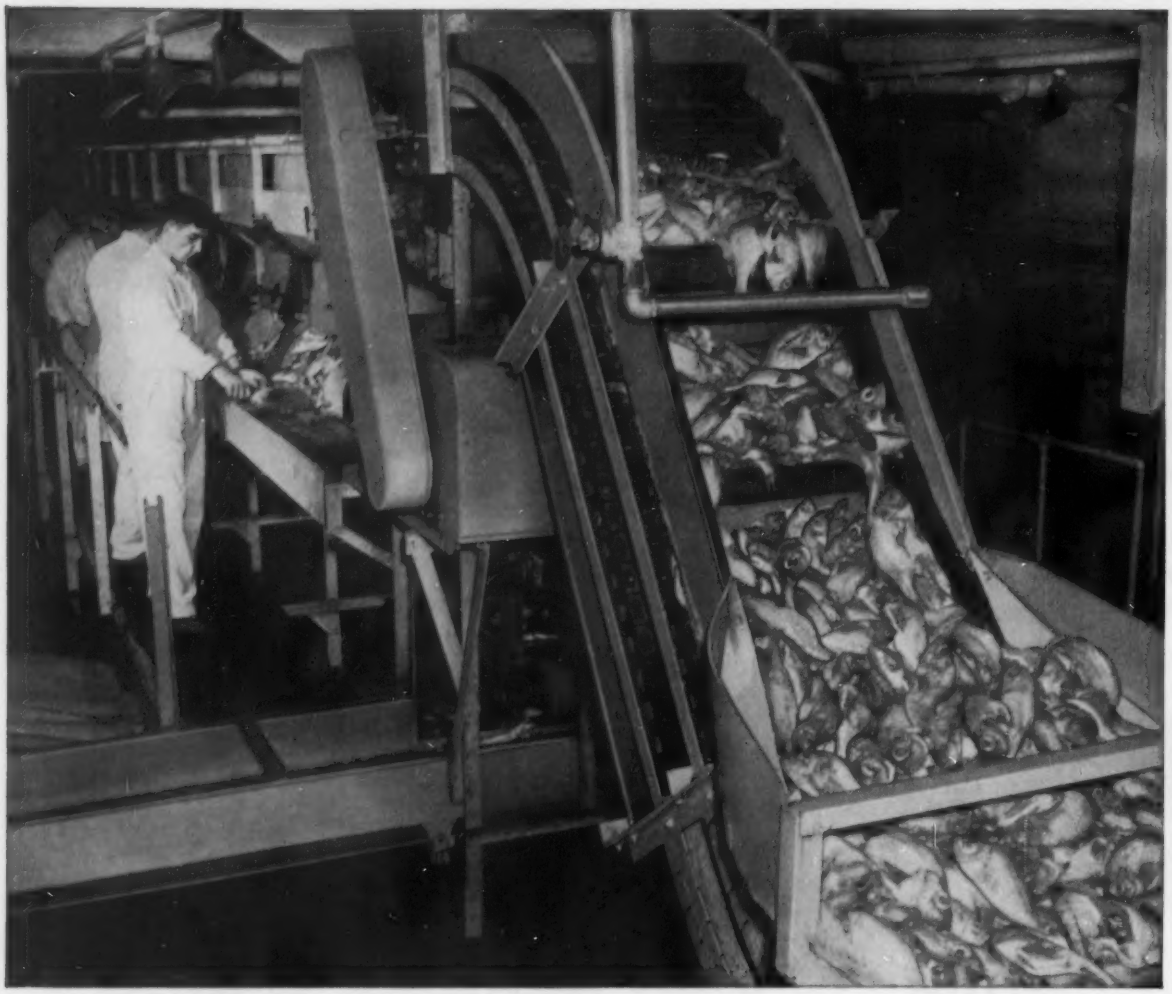
Company_____

Title_____

Address_____

City_____ Zone____ State_____

For more data, circle this page number on card at back →



try TITANIUM for the tough jobs

Take, for example, fish packing, where the corrosive attack of sea water and brine on equipment is a costly problem. It's no problem for REM-CRU titanium, though—for titanium is entirely immune to such attack. In fact, test samples of REM-CRU titanium were exposed to sea water and ocean atmosphere for *five years* with almost imperceptible effect . . . it would have taken 1250 years to reduce the thickness of the sample .001"!

Titanium can end corrosion problems, too, in vegetable canning – condiment bottling – any type of food processing where corrosive conditions are encountered.

For titanium has so many remarkable properties that until recently most of it was reserved for defense production. But *now* there are adequate amounts of REM-CRU titanium available for your use. And that's good news, for titanium can handle many tough jobs in the food processing industry better than any other material. REM-CRU, leading producer of titanium, will be glad to work with you in making the best, most profitable use of this versatile new metal.

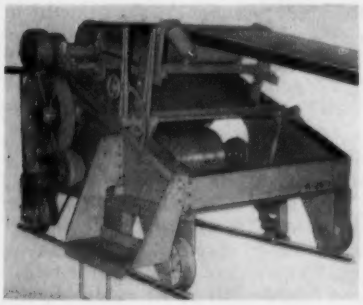
To keep abreast of the latest developments on this vital metal, write to Dept. F-5, for the Rem-Cru Review—a free periodical presenting the latest technical data on titanium alloys.

REM-CRU TITANIUM

REM-CRU TITANIUM, INC., MIDLAND, PENNSYLVANIA

stroke, while ground-level type has a 60-in. stroke. Lifts are equipped either with a self-starting switch or an overhead pull switch.—*Field Engineering Products Co., Jamestown, N. Y.*

Circle 1328 on Reader Service Card

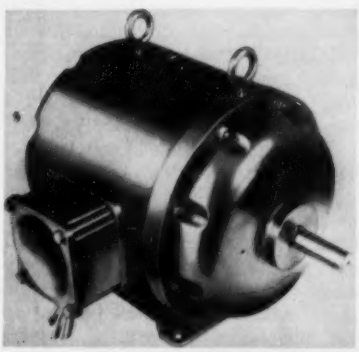


Self-Propelled Trippers Ease Grain Conveying

New belt-conveyor trippers accommodating long center-roll, deep-troughing idlers are available for use with conveyors handling light materials such as grain.

When drive mechanism is changed from shaft to chain transmission, tripper (Style No. 55) not only clears 45- and 35-deg. grain-type idlers, but also keeps headroom requirements to a minimum. A self-propelled unit, it has a manually-operated friction drive permitting travel against and with direction of belt travel. Other advantages: Heavy-gage-steel unit construction, main bearings (Sealmaster), and choice of left-hand or right-hand operation.—*Stephens-Adamson Mfg. Co., Aurora, Ill.*

Circle 135A on Reader Service Card



New Units Extend Range Of Explosion-Proof Line

Underwriters' requirements for the most common hazardous conditions—gases, explosive dust, and explosive grain dust—reportedly are met by this

CAMPBELL VACUUM PACK
MEAT AND FOOD WRAPPER
PAYS FOR ITSELF IN LESS THAN
SIX MONTHS TIME ON JUST
MATERIAL & LABOR SAVINGS!
Fast, automatic CAMPBELL wrapper saves up to 60% on vacuum drawing packaging films and materials
No question about it — the CAMPBELL Vacuum-Pak's simplified one person operation; its close-fitting vacuum drawn wrap which requires no trays or stiffeners, unless desired — ACTUALLY saves enough money on materials and labor alone over competitive methods to pay for itself in 4 to 6 months time! In addition, the product's tight wrap minimizes puncture risk and is vacuum guaranteed.
Used by America's leading packers, this ingenious automatic vacuum wrapper packages sliced luncheon meats, bacon, chops, patties, wieners, cheese and other food products with equal ease and speed. Simple adjustments require minimum down-time for product change-over. Get complete cost and production facts today.
POSITIVE Guaranteed SEALING
• 98% of packages positively sealed and guaranteed.
• Vacuum drawn wrap eliminates shrinkage, flavor and color loss.
• Tremendous savings in wrap materials and labor.
• Delivers 40 to 70 Units per minute
• Extends product's shelf life—reduces spoilage and returns.
• Close wrap reduces puncture risk.
Less than 2% package "Leakers"
It is hereby guaranteed that out of every 100 units Vacuum-packed on a CAMPBELL Vacuum Pack Meat and Food Wrapper in regular production service — 98% or more will be positively sealed against leakage at sealing areas of heat-sealing wrapping material used for the package.
HUDSON-SHARP MACHINE CO.
GREEN BAY, WISCONSIN
GET THIS FREE BROCHURE
There's a Campbell Wrapper for packaging hundreds of fresh and frozen food items. Write for full colored descriptive brochure today on your company letterhead.
Campbell
WRAPPER
HUDSON-SHARP MACHINE CO. • GREEN BAY, WIS.
Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Crepers and Tissue Converting Units.
NEW... Campbell-Pak
Another first — converts roll stock to low cost filled and heat sealed bags for manual or automatic sequence packaging of liver, brains, kidneys, tongue, kraut, cheese and other products. Write for descriptive literature on this entirely new method packaging machine.

W & T CHLORINATION...

complete algae control for 25% of the cost of best previous treatment

The Geo. Wiedemann Brewing Co., of Newport, Kentucky had an algae problem on the water-side surfaces of their pasteurizers that increased operational costs, cut pasteurization efficiency, caused corrosive pitting of the units, and created very objectionable odors.

Five years ago, after trying other treatments, a Wallace & Tiernan chlorinator and proportioning solution panel were installed. The chlorination treatment has been completely successful in eliminating the problem at about one-fourth the cost of the best treatment tried previously.

A Wallace & Tiernan chlorination system can correct problems caused by algae growths in your process. Write for our free bulletin 2136-C that describes the Geo. Wiedemann Brewing Co. case history, and tell us of your specific problem.

WALLACE & TIERNAN INCORPORATED

25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

I-54

W&T MERCHEN SCALE FEEDERS & METERS

for Automatic Batch Control
Continuous Blending
Materials Accounting

Control the feeding of ingredients by weight to an accuracy of 1%.
Capacities range from 3 to 3000 lbs. per min.

WRITE FOR YOUR COPY OF OUR BULLETIN:
"The Best Weigh is the Merchen Way."

WALLACE & TIERNAN INCORPORATED

25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

M-31

Equipment & Supplies

line of explosion-proof motors, complete through NEMA frames 405 and 215.

Four bolts anchor the gasketed cast-iron explosion-proof terminal box to the frame. Leads are sealed at both the motor shell and the outer shell. Repellent grease in the shaft-extension end keeps moisture away from the sealed, pre-lubricated bearings. Long flame paths at the bracket fits and shaft hub offer positive snuffing action —no chance for flame to reach the outside atmosphere to ignite explosive mixtures.

All steel parts of the motor are undercoated for moisture resistance, while those of cast-iron are treated against corrosion. Insulation is tough and flexible. Units are available with optional mountings in standard, geared, or variable-speed models. — *Sterling Electric Motors, Inc.*, 5401 *Telegraph Rd., Los Angeles* 22.

Circle 135B on Reader Service Card

Field Tests Are Simplified By Bacteriological Kit

To ease and speed bacteriological testing under field conditions, this kit (Field Monitor) employs pre-sterilized, expendable components that adapt maker's filter membrane to a variety of test procedures.

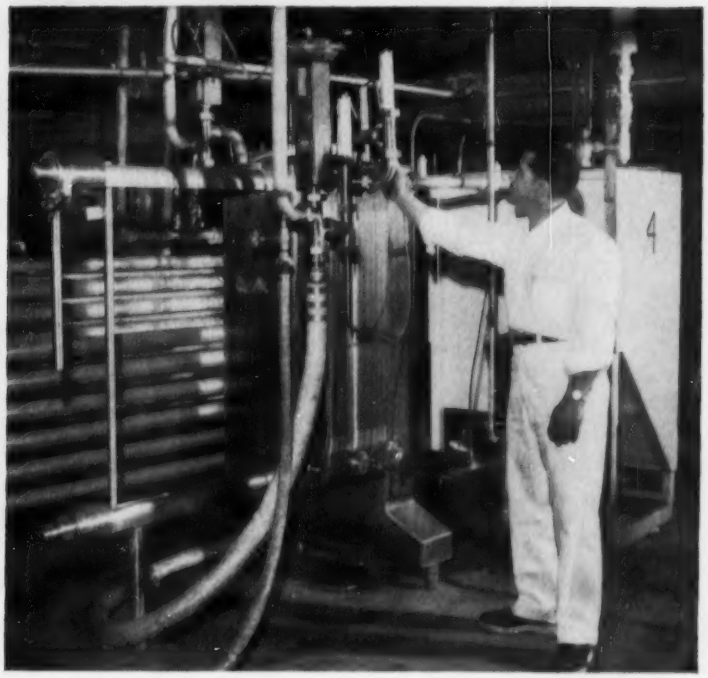
The membrane, which concentrates bacteria on its surface, is sealed in a sterile plastic unit that acts as a filter holder and an incubation dish. In operation, sample is drawn through unit with a syringe and culture medium is introduced from sterile ampuls. Samples may then be sent to the laboratory or incubated and examined in the field.

Latter is accomplished with a special field incubator that operates on 6 or 12v. from a vehicle battery, or on 110/220v. house current.—*Millipore Filter Corp., Watertown* 72, *Mass.*

Circle 136A on Reader Service Card

"OUR DE LAVAL PLATE PASTEURIZER IS A GREAT HELP"

E. & J. GALLO WINERY



"We find that our De Laval plate type pasteurizer is a great help in maintaining the precision temperatures required in the production of Gallo wine," writes Mr. Charles M. Crawford, Production Manager, E. & J. Gallo Winery, Modesto, Calif.

"The unique advantages of no leakage, low back pressure, and ease of cleaning are fully in line with our tradition of quality above all as America's leading wine."

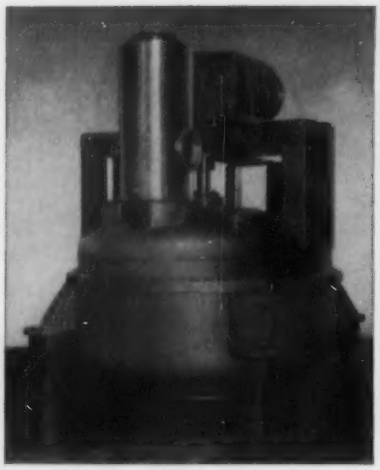
•

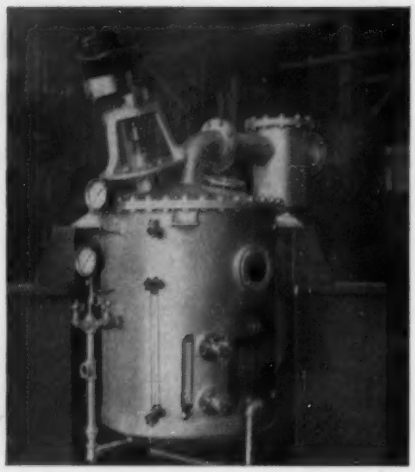
De Laval Plate Heat Exchangers have many other advantages—all fully described in De Laval Bulletin PHX. Write for it *now*—whether you're interested in pasteurization, heating, cooling, heat recovery or regeneration.

DE LAVAL
plate heat exchangers

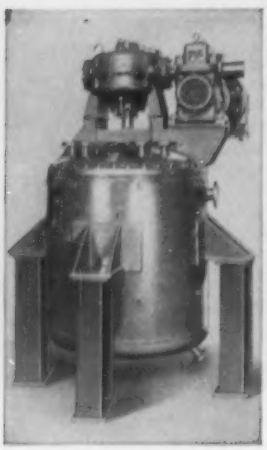
THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 201 E. Millbrae Ave., Millbrae, Calif.

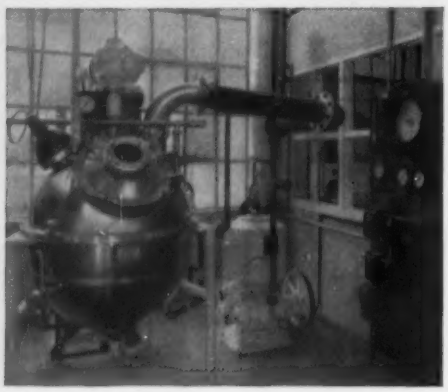
Chemicals, resins, grease, foods, pharmaceuticals, cosmetics, confectionery, dental and shaving creams, detergents





THE RIGHT KETTLE FOR EVERY PROCESS NEED...





with different types of agitators and mixers, heating methods, controls

There is a *right* kettle for every processing requirement. End product, capacity desired, heat source and method, agitation and drive, and other factors determine the type and size of kettle. After about 50 years of experience in process engineering, Blaw-Knox engineers are prepared to build the kettle to your design or engineer, design and construct a kettle to fit your operations.

We invite your inquiries.

A Complete Process Equipment Service

Kettles of every description constitute but one phase of Blaw-Knox Process Equipment design, engineering and fabrication service for the chemical, food, pharmaceutical, plastic and resin, petroleum, rubber and other industries:

EVAPORATION · DRYING · FLAKING
MIXING · IMPREGNATING · REACTION
VULCANIZING · SOLVENT RECOVERY
SOLVENT EXTRACTION · STERILIZING
CRYSTALLIZATION · DISTILLATION
POLYMERIZATION · GAS CLEANING
GAS ABSORPTION · VAPORIZATION
CONDENSATION · HEAT TRANSFER
LOW AND HIGH PRESSURE PROCESSING

BLAW-KNOX COMPANY
BUFLOVAK EQUIPMENT DIVISION
1637 Fillmore Avenue, Buffalo 11, N.Y.

Makers of process equipment engineered for any pressure, temperature, capacity, reaction

BLAW-KNOX

New Chemicals

Metal-Treating Compound Offers Double Protection

When applied to rusted surfaces, this metal-treating compound reportedly stops rust action and prepares the metal for paint at the same time.

Called Ospho—a mixture of phosphoric acid, dichromate, extenders, and wetting agents—it changes rust (iron oxide) to iron phosphate. In preparing new metal for paint, it imparts a slight etch that produces microscopic hooks for good bonding of metal to paint. Later adheres tightly to prevent moisture from contacting the metal, thus the job lasts longer.

Further, preparation time is cut as scraping, flame-cleaning, and sandblasting are eliminated. Instead, loose rusted scale is removed by wire brush, then product is brushed or sprayed on. —*Rusticide Products Co., 3125 Perkins Ave., Cleveland 14.*

Circle 139A on Reader Service Card

New Roof Coating Keeps Plant Interiors Cooler

An aluminum-asbestos roof coating is said to reduce building interior temperature by as much as 20F.

Called Asbestolite, it consists of asphalt, asbestos, water-proofing oils, and minute aluminum flakes that "leaf" to form an attractive light-reflective coating. When applied to roofs of air-conditioned buildings, it cuts the cost of refrigeration.

Material comes in 5-gal. cans, and 30- and 55-gal. drums ready for use. It can be sprayed or applied by brush or squeege. Further, the coating can be put on old tar or asphalt without bleeding.—*Monroe Co., 10703 Quebec Ave., Cleveland 6.*

Circle 139B on Reader Service Card

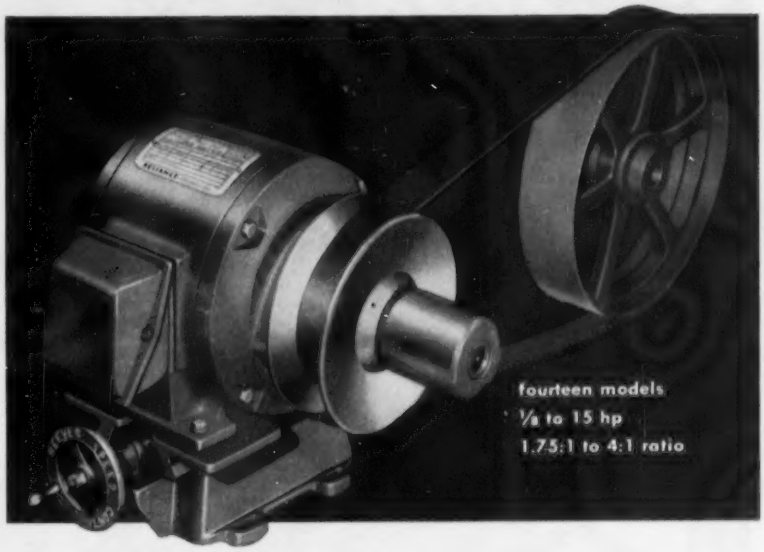
Mold Growth Is Inhibited By New White Enamel

Compounded with a fungicide that reduces mold and "rope" growth, this enamel is recommended for interior use in bakeries, dairies, and flour mills.

Applied by brush or spray, product (Froslite) covers up to 600 sq. ft. Applied as directed, it protects walls and equipment, and is free of paint odor. Material provides a white finish that resists fumes and stands up under frequent washing.—*Frost Paints and Oil Corp., 1203 N. E. Tyler, Minneapolis.*

Circle 139C on Reader Service Card

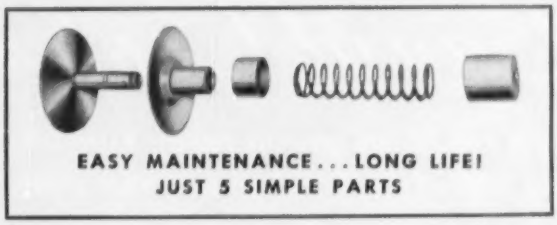
The low-cost answer to wider use of your machines



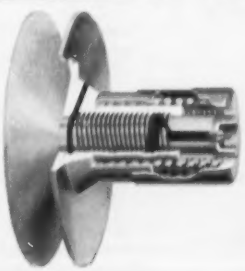
REEVES

Vari-Speed Motor Pulley

Add the advantages of accurate variable speed control to your existing machinery with this compact unit. Add versatility and extended life... handle more shapes, sizes and materials!



REEVES "Close-grooving" —a special lubrication system—insures free sliding disc for easy speed changes.

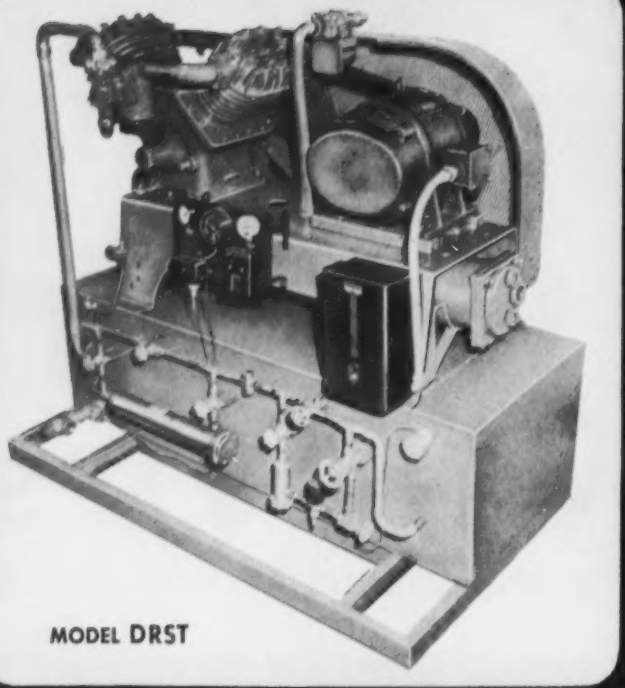


For bulletin complete with rating charts and dimensions, write Dept. FE21-V545.

REEVES DIVISION • COLUMBUS, INDIANA

RELIANCE ELECTRIC AND ENGINEERING CO.

COOLING A PROBLEM?



MODEL DRST

DOYLE & ROTH "PACKAGED" *Liquid Cooler*

D. & R. COOLERS are presently cooling: Water, Oils, Gases, Soluble Coffee Extract anl many other Liquids

The package includes a complete refrigeration cycle, compressor, motor and starter, refrigerant controls, liquid cooler, refrigerant condenser, piping, wiring and insulation completely assembled and tested, ready for quick installation and immedjate operation. These units are available in a range of sizes from 5 to 100 tons of refrigeration – & for temperatures ranging from 65° F. to –100° F.

CONTACT DOYLE & ROTH for prompt attention to your INDIVIDUAL REQUIREMENTS

DOYLE & ROTH *Manufacturing* CO. INC

136-50 TWENTY-FOURTH STREET, BROOKLYN 32, N. Y.

Briefs . . .

New Globe Valves of bronze–now rated at 200 psi. steam, 400 psi. water, oil, and gas—offer special alloy seating metal for resistance to wear and corrosion, also flat-seat design that eliminates regrinding.—*Lunkenheimer Co., Box 360, Cincinnati 14, Ohio.* (140A)

Pressure-Sensitive Tape with silicone adhesive anchored to Teflon backing. permits easy sliding for use on food equipment.—*Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6.* (140B)

Bun Pans for retarding and freezing of baked goods eliminate use of dusting flour, also serve as transporting and display units. Colored pan (18x26 in.) is non-corrosive, easily steam cleaned. —*Molded Fiber Glass Tray Co., Linesville, Pa.* (140C)

Heavy-Duty Moving Dollies enable rapid, safe handling of large equipment without skids, pipes, or winches. —*Mighty Mover Co., 1482 S. Milwaukee St., Denver 10.* (140D)

Reusable Clamp Fitting of malleable iron is two-bolt, high-pressure unit permitting swift hose replacement.—*Flex-O-Tube Div., Meridan Corp., 2525 Jim Daly Rd., Inkster, Mich.* (140E)

Centrifugal Fan Ventilator mounts on roof to exhaust ducts serving small areas. Aluminum unit operates at low noise level.—*Swartwout Co., 18511 Euclid Ave., Cleveland 12.* (140F)

Stainless-Steel Dissolvers offer special impellers for handling wide variety of materials with viscosities to 50,000 cps. Motor placement cuts headroom requirements. — *Morehouse-Cowles, Inc., 1150 San Fernando Rd., Los Angeles.* (140G)

Imitation Pear Flavor imparts sweet character of the natural fruit to hard candies. It is used at rate of 1-1½ oz. per 100 lb.—*Givaudan Flavors Inc., 330 W. 42 St., New York City 36.* (140H)

Truck-Refrigeration Unit holds 35-40 F. temperature in 300-600 cu.-ft. compartment with 100F. ambient.—*Frank-Dewey Co., 10228 Woodward Ave., Detroit 2.* (140I)

Meat-Ball Former produces 50-1,500 pieces per min. Stainless unit weighing 450 lb. is easily cleaned, occupies 24x80 in. of space.—*Allan W. Parker Co., 420 Market St., San Francisco 5.* (140J)

AL CHROMIUM-MANGANESE *LOW-NICKEL* STAINLESS GRADES

Here is a direct answer to the recurring problem of nickel shortage. For many users of chromium-nickel austenitic stainless steels, the new AISI 200-series of chromium-manganese low-nickel austenitic grades can be a source of immediate relief—and an avenue to the reduction and possible avoidance of nickel shortage problems in the future.

In many cases, you can switch directly from the older Type 301 and 302 grades to the new AL Stainless Type 201 and 202 steels, using the same fabricating processes and securing about the same results. There's nothing new to learn, and no loss in performance in practically all applications. In certain respects, these steels have better properties than the older materials and may be used to actual advantage in some cases.

We also produce low carbon grades of these chrome-manganese steels, arbitrarily designated Types 204 and 204L (similar to the older grades 304 and 304L) . . . as well as a lower-chromium, higher-manganese grade designated Type CM, which contains only 1% nickel. Allegheny Ludlum has pioneered in the development and application of these low-nickel stainless steels. We know what the new grades will do . . . let us help you put them to use. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

WRITE FOR THE ASSISTANCE YOU NEED

1. "TECHNICAL STUDIES #3"

. . . essential information on the composition, properties, fabricating methods and applications of AL chromium-manganese, low-nickel stainless steels. *Write for your copy.*

2. TEST SAMPLES

. . . We'll be glad to supply engineering assistance, and actual samples of these 200-Series steels for testing under your processes and conditions.

ADDRESS DEPT. FE-77

For Stainless Steel in ALL Forms—call

Allegheny Ludlum

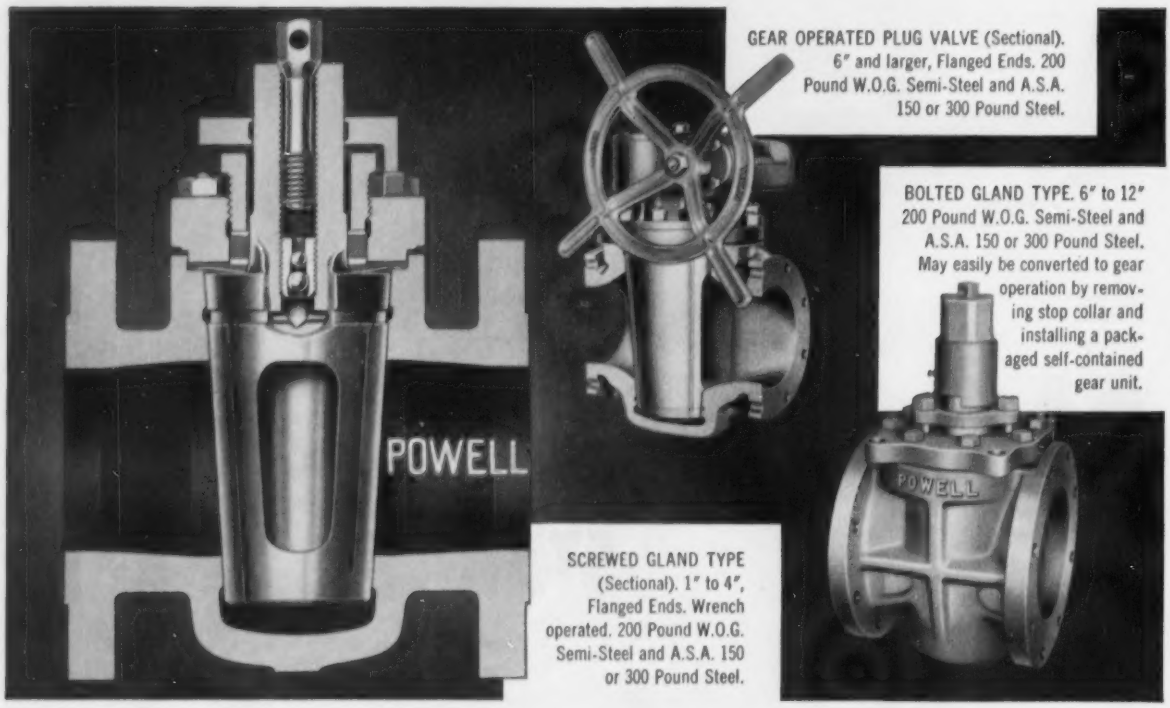
AL STAINLESS STEEL

WWW 8750

Warehouse stocks carried by all Ryerson Steel plants

POWELL

Lubricated Plug VALVES



GEAR OPERATED PLUG VALVE (Sectional). 6" and larger, Flanged Ends. 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel.

BOLTED GLAND TYPE. 6" to 12" 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel. May easily be converted to gear operation by removing stop collar and installing a packaged self-contained gear unit.

SCREWED GLAND TYPE (Sectional). 1" to 4", Flanged Ends. Wrench operated. 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel.

Powell Lubricated Plug Valves maintain our 110-year tradition of quality and precision. Only the finest available materials are used. And painstaking quality control is rigidly enforced through each and every step of manufacture.

Features include quick and positive operation—just a quarter-turn to open or close. Lubricant grooves surrounding each port provide a positive seal when the valve is closed. In an open position, seating surfaces are not exposed.

Valve users who want one source of supply for lubricated plug as well as all types of bronze, iron, steel and corrosion-resistant valves will want full details on Powell Lubricated Plug Valves.

Available in Steel and Semi-Steel through distributors in principal cities. If none is located near you—or if you need help on valve problems—write direct to

PERFORMANCE PV VERIFIED

BRONZE, IRON, STEEL AND CORROSION-RESISTANT VALVES

The Wm. Powell Company, Cincinnati 22, Ohio . . . 110th YEAR

The source of supply for all valve needs!

Equipment Applications

Sandwich-Type Panels Cut Plant-Construction Costs

Use of sandwich-type panels for curtain-wall construction—a new application for this low-temperature insulation—has cut plant-construction costs for Burke E. Porter Machinery Co., Grand Rapids, Mich.

Furthermore, the material (Hasko-Struct, Haskelite Mfg. Corp., Grand Rapids, Mich.) offers structural strength, resistance to moisture and vermin, and low maintenance cost.

Panels consist of exterior and interior faces of polyester-laminated glass cloth and built-in polystyrene insulation. The entire wall of the plant, built on a concrete foundation slab with total area of 8,480 sq. ft., was hung in 85 man-hours.

Steel framing was designed to accommodate 4 ft. x 8 ft. panels 2¼ in. thick. Bottom of each panel, grooved to fit into a steel spline in the base plate, was sealed in place with tar-base mastic. For air- and water-tightness, panels were joined with splines of 4½-lb.-density expanded polystyrene inserted in edge joints.

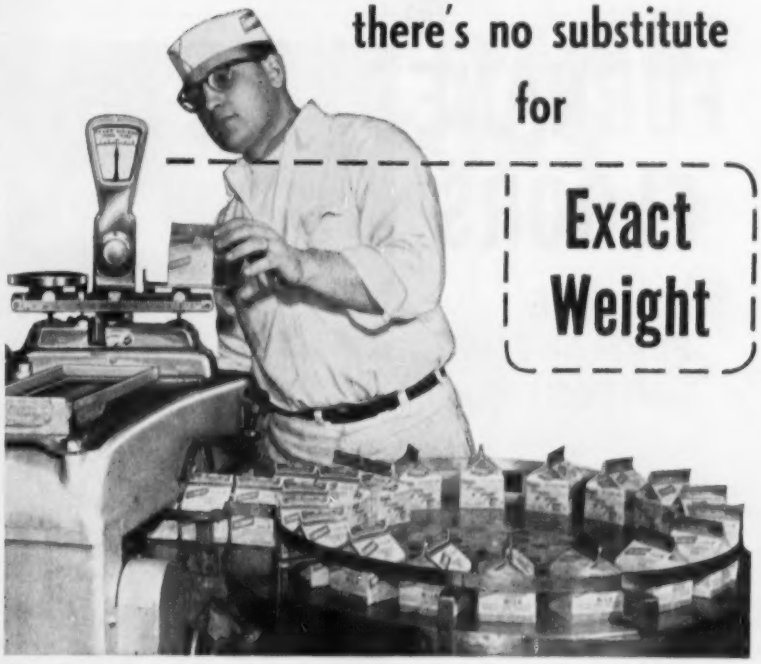
Walls of the combination factory and office building comprise a lower 8-ft. panel hung vertically, a middle panel of conventional glass windows, and a top panel hung horizontally.

Circle 143A on Reader Service Card

Self-Lubing Sump Pumps Boost Boiler Efficiency

Submerged vertical centrifugal pumps have improved operation of the boiler condensate-return system at Morgan Engineering Co., Alliance, Ohio. In addition to eliminating for-

overweight or underweight
. . . . when you must be sure
there's no substitute
for
Exact Weight



Checkweighing packages such as cartoned milk and cream is necessary to protect your profit margin by reducing overweights. Fractional ounces often mean the difference between profit and loss in such a "high volume—low profit" product.

Exact Weight Scales checkweigh packages to closest tolerance accurately and quickly. On scales used for checking small packages, as shown above, one inch of indicator travel equals one ounce of weight. Dial is over and under type, center marked. Adjustable damping action and short lever fall brings pointer to rest quickly for a fast and accurate reading.

Models are available for any capacity—model 103 (in photo) has 3 lb. capacity. Model 273 (right) is recommended for ½ gallon and gallons. Model 940, end tower scale, has 50 lb. capacity.

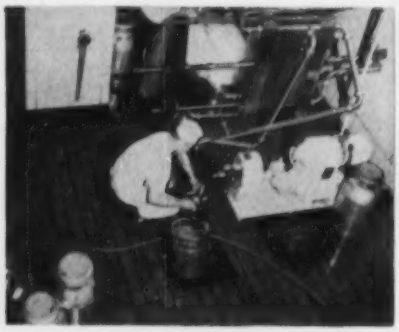
Sales and Service Coast to Coast

Exact Weight Scales
Better quality control
Better cost control
THE EXACT WEIGHT SCALE COMPANY
910 W. Fifth Avenue, Columbus 8, Ohio
In Canada: P. O. Box 179, Station S, Toronto 18, Ont.

THROUGHOUT THE INDUSTRY

FURNANE® FLOORS

GIVE PERMANENT PROTECTION



A Pennsylvania Dairy

A Texas Meat Packing Plant.

An Ohio Margarine Producer

A Virginia Prison Dining Hall.

Atlas, pioneers in corrosion engineering, have developed this patented* method of floor construction, designed specifically for the food industry. The properties incorporated in the design of FURNANE FLOORS permit its use under almost any condition in the food industry.

Among their many features, patented* FURNANE FLOORS exhibit:

CHEMICAL RESISTANCE . . . to food acids, food by-products and cleaning agents.

STRUCTURAL STRENGTH . . . resulting from high adhesion and dual cement construction.

SANITARY SURFACES . . . because flush joints permit no harbors for disease producing germs.

ATTRACTIVE APPEARANCE . . creating a pride of ownership.

"Food Floor Facts"—a twenty page bulletin describing all the features of FURNANE FLOORS — is yours for the asking.

*** Fully protected by the U. S. Patents Nos. 2,690,411; 2,689,237; 2,669,522.**

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

Equipment & Supplies

mer costly maintenance and replacement, they use about ½ less power.

Previously, hot condensate prevented proper lubrication of bronze impeller bearings submerged in 4-ft.-deep collecting tanks. Bearing and impellers wore rapidly, thus interrupting the continuous system. And steam, which often escaped through traps into the tanks, caused pump-control floats to bob up and down, turning pumps on and off erratically.

New units (Deming Co., Salem, Ohio) have lower impeller bearings of babbit graphite, therefore require no lubricant other than the water covering them. And electrode-rod controls, which use condensate as a conductor, operate the pump motor.

Circle 143B on Reader Service Card

Multi-Size Bottles Handled In Double-End Washer

With its recently installed 8-quart-wide bottle washer, Nehi Bottling Co., Centralia, Ill., can now package 6-32 oz. sizes without adjustment or delay.

The washer (Double End Automatic, Dostal & Lowey Co., Menomonee Falls, Wis.) is available for pints 8 to 32 wide in 6-12 oz. sizes, and as a quart model—8, 12, 16, and 20 wide to handle 6-32 oz. sizes.

Circle 144A on Reader Service Card

Expanded Aluminum Ups Route-Truck Efficiency

Use of expanded aluminum racks in their bakery delivery trucks has cut operating costs for Storck Baking Co., Parkersburg, W. Va.

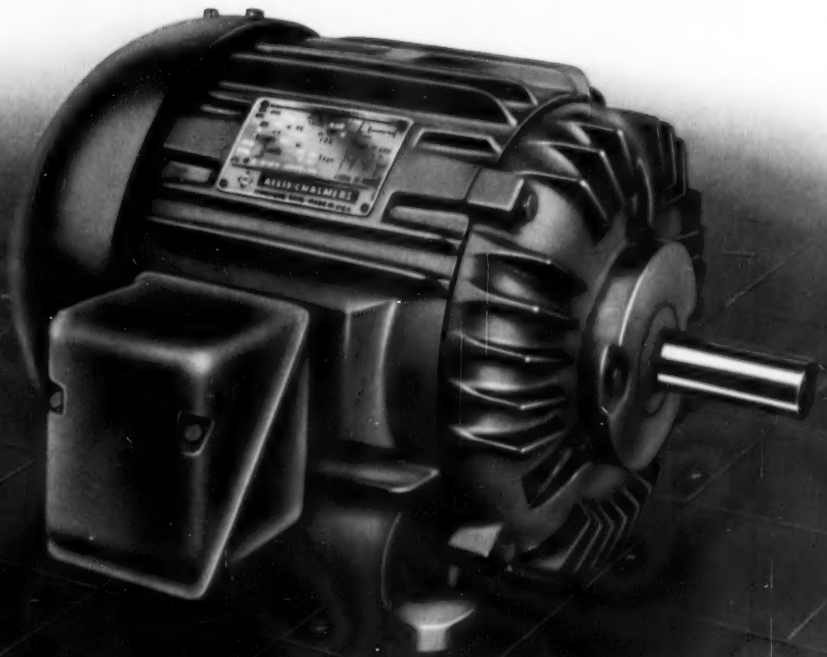
Since trucks must be sanitized regularly, quick drainage and drying of these racks makes it possible to quickly return trucks to service.

Expanded aluminum (Penn Metal Co., New York City) is aluminum sheet that has been slit and expanded to as much as ten times its original width. Up to 80% lighter than the original sheet, it has a high percentage of open area, yet is strong and rigid. Racks may be fabricated by a plant's crew or by a sheet-metal shop.

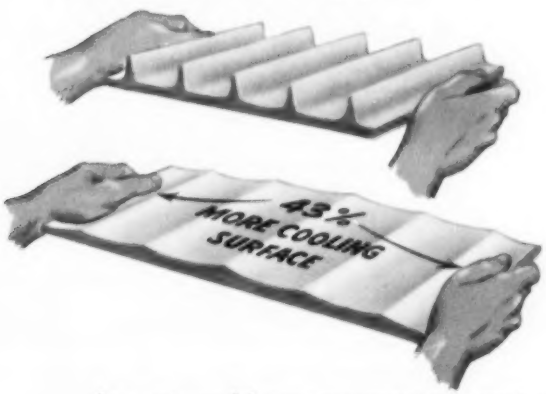
They are made up of 1x1x⅛ in. or ¾x¾x⅛ in. aluminum angles or extrusions to which ¾-in. flattened expanded aluminum is welded. Racks are finally sprayed with a methacrylate lacquer to eliminate "smudge" that rubs off uncoated aluminum. This coat is periodically reapplied.

Circle 144B on Reader Service Card

There's MORE *Cooling Surface* with Allis-Chalmers MOTORS



Why Rib-Type Motors Won't Fry



STRETCH OUT RIB DESIGN of Allis-Chalmers motors and see the greater cooling area provided — as much as 43% on many models. Insulation won't fry under normal conditions with deep-rib construction because every rib adds to the heat-dissipating surfaces. The result—moderate overloads can be taken in stride with little fear of burnouts.

As a new machinery component or as replacement, specify Allis-Chalmers. To find out more, contact your nearby A-C district office, distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-4882

Who's handling public relations for you behind the Iron Curtain?

It's not an easy assignment—or the kind you'll find many people volunteering for.

But there *is* an important "public relations" job to be done behind the Iron Curtain—for you . . . for America . . . for the whole concept of freedom, free enterprise and individual rights. This job is an opportunity and a challenge as well as a serious responsibility for American business. Fortunately, with your help, there *is* an agency that can do the job—*Crusade for Freedom*, which supports Radio Free Europe and Free Europe Press.

Both these powerful, privately operated organizations continually challenge the barrage of Communist misstatements and false truths. Using saturation radio broadcasts and mass newspaper drops from message balloons, Radio Free Europe and Free Europe Press are constantly on the offensive against the Red campaign to annihilate right, reason and national pride.

Continued and heated Communist protests testify to the tremendous effectiveness of Radio Free Europe and Free Europe Press. Support freely given by free American business and private citizens will increase this effectiveness and the scope of their operations. A contribution now is perhaps the best investment you can make towards a peaceful, prosperous world.

Give generously. It's your future!

Check list for business executives in the Crusade for Freedom

- ☐ Order display material for your company bulletin board.
- ☐ Plan a paycheck stuffer to fully acquaint your employees with the importance of the Crusade for Freedom.
- ☐ Plan to conduct an in-company solicitation.
- ☐ Match employee funds with *your Truth Dollars*.

PUBLIC SERVICE ADVERTISING COUNCIL

For campaign material and information write **CRUSADE FOR FREEDOM,** 345 East 46th St., N. Y. C. 17.

Upping Taste Uniformity

—*Continued from page 56*

Validity of this theory was confirmed by thousands of taste-tests on practically identical samples.

For example, the 50% figure averaged out during the selection of 17 standards by 223 panels (10 tests per panel).

In the responses, panel scores (10 tests) may range from 0-right-and-10-wrong (0 to 10 score) to 10-right-and-0-wrong (10 to 0 score).

Invalid scores are 3 to 7, or less. Such scores are considered invalid because of the possibility that the panels have failed to perform properly—their correct response being less than chance results.

Resolved by Retesting

A 4 to 6 score is allowed only one panel in rating a tank. When invalid scores occur, succeeding panels retest the tank.

Tanks are cleared on the basis of two-panel scores running in the 9-to-11 and 14-to-6 range (see accompanying Scoring Pattern Procedure). Scores between 15-5 and 20-0 indicate a possible significant difference and so necessitate further testing by a third panel.

In this case, tanks are only given the green light when the 30 tests show scores from 19 to 11 and 20 to 10. Decision is up to the master brewer when they score 21 to 9 or 22 to 8.

Formerly, tanks were withheld from bottling when scored 23 to 7, or higher, on only 30 tests. However, due to the improved skill of the panels and their sensitivity to inadvertent differences, tanks are now retested by a second set of 3 panels for a total of 60 tests to avoid chance rejection of tanks.

If the retests confirm the significant indication of non-uniform flavor, the tank is reblended in the finishing cellar. Tanks with reblended beer are retested for uniformity.

In all cases where a tank is either questioned or rejected outright, the masterbrewer and his assistants check out the possible cause of non-uniformity and decide on what reprocessing is advisable.

Keeping Tasters Keyed Up

To keep panelists on the ball, an incentive program was initiated—for success of the program depends on constant striving for accuracy by panelists. The plan involves issuing of a weekly report to all panel members, announcing participants with highest evaluation ratings (based on correct answers for 40 weekly tests). The winner gets a 24-bottle case of beer.

Also reported is the panel with the highest average score. In this case, each panelist gets a 12-can case of beer.

Once a month, each panelist showing a 5% rate of improvement also gets a 24-bottle case of beer. Those with consistently poor records are dropped from panels.

Over a short period, it proved practical to select SQC-checking samples from finishing tanks, rather than from the bottling tanks (although the latter offer the most ideal sampling point with respect to finished product).

Reason is that thus bottling operations are not delayed and, in case of rejection, beer does not have to make return trip to the finishing cellar. And so the place for corrective action, as required by the new SQC taste-testing technique, is the finishing cellar.

Getting Standards

New reference standards are searched for every four weeks—by comparison with the current standard. Samples for this are drawn, however, from several bottling tanks rather than finishing tanks. Panelists then make a total of 100 tests, with the tank selected for the new standard being that most closely matching the current one. Its score must be in the 50-to-50 and 55-to-45 "right" and "wrong" response range.

When the standard is matched, 20 cases from the matching tank of beer (a four-week supply) are picked up just ahead of the pasteurizer and stored in a 33-34 deg. F. cooler. A case of this beer is used for each day's taste-testing by the SQC panel members.

SQC in all cases must make certain that the taste-uniformity of the current standard is up to par.

Double Check

Periodically, SQC submits standard samples to the masterbrewer's committee for blindfold-testing. This is a double-check to see how the committee rates this sample as a preferred or new standard, and it assures SQC keeping pace with quality improvements.

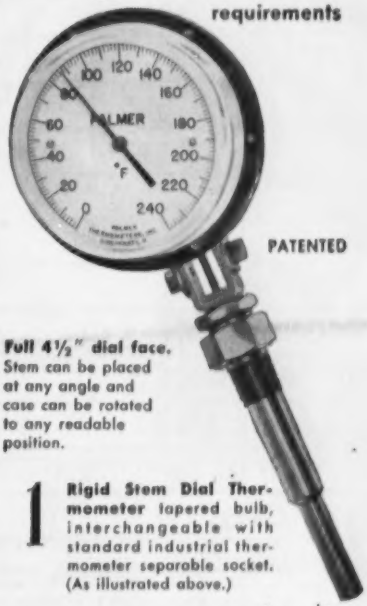
Selection of an entirely new standard by the masterbrewer's committee may be justified periodically, either because of minute taste changes in the sample or because of taste improvements achieved by the brewing experts.

End (*Resume reading on page 57*)

PALMER
MERCURY ACTUATED

DIAL THERMOMETERS

in 3 types to suit any requirements



PATENTED

Full 4½" dial face. Stem can be placed at any angle and case can be rotated to any readable position.

1 **Rigid Stem Dial Thermometer** tapered bulb, interchangeable with standard industrial thermometer separable socket. (As illustrated above.)

2 **Wall Mounted Dial Thermometer** with flexible connecting armor. Case adjustable to easy reading position.

3 **Flush Mounted Dial Thermometer** for panel mounting with flexible connecting armor.

All three types have a full 4½" dial face.

for accuracy: Mercury actuated . . . Fully Compensated by Invar Compensator. Guaranteed Accurate 1 scale division.

for angularity: Can be adjusted to most readable position at any angle desired.

for readability: Bold Black Numbers . . . 11" of scale Reading Dial face can always be placed in easiest readable position.

for interchangeability: Always specify "PALMER" Separable sockets as they are interchangeable for Dial or Industrial type Thermometers.

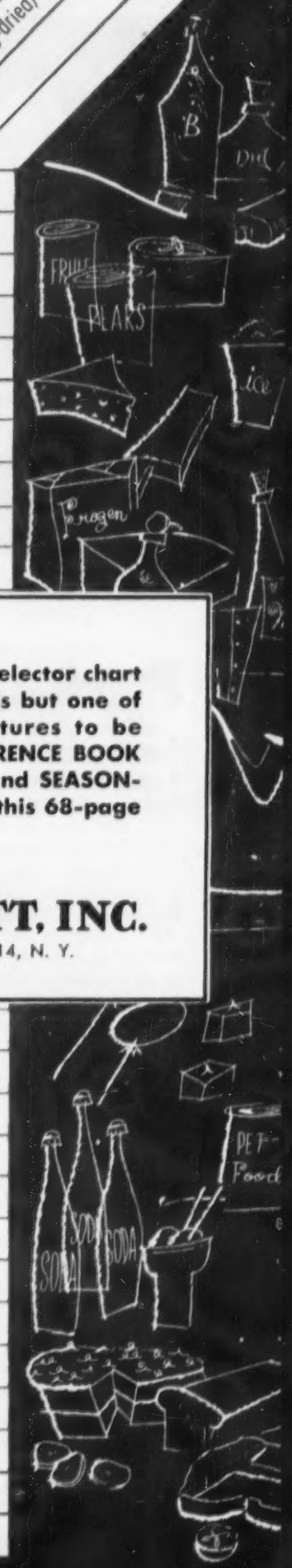
Write for Catalog information

PALMER
THERMOMETERS, INC.
Norwood Ave., Cincinnati 12, Ohio
Mfrs. of Industrial Laboratory Recording and Dial Thermometers

For more data, circle this page number on card at back →

	DOLCO® 5200 LINE FLAVORS	COSMO® FLAVORS	CONAX® FLAVORS	OIL SOLUBLE FLAVORS	DOLCOTT® FLAVOR AROMA BASES	DOLCOTT® HARD CANDY FLAVORS	MICROMUL® FLAVORS	AP-RO-PO® FLAVORS	DOGEN® GENUINE FRUIT EXTRACTS	DOSIX® FLAVORS	D & O REINE	DO
ANIMAL AND PET FOODS												
BAKED GOODS	√	√	√	√				√		√		
Cake Mixes												
Dough and Batter	√	√	√	√				√				
Emulsions	√		√	√			√					
Icings and Toppings	√	√	√	√	√			√		√		
Jellies	√		√		√			√		√		
Pie Fillers	√	√										
Mince Meat												
BOTTLERS FLAVORS	√	√	√				√		√	√	√	
CANDY AND CONFECTIONERY	√	√		√	√	√		√		√		
Coatings				√				√				
Cream Centers	√	√						√		√		√
Gums and Jellies	√	√			√					√		√
Chewing Gum	√											
CANNED GOODS												
CONDIMENTS												
Pickles and Relishes												
Salad Dressings												
Sauces and Catsup												
CORDIALS AND LIQUEURS									√	√	√	√
DIETETIC AND LOW CALORIE FOODS												
FROZEN FOODS												
HOUSEHOLD EXTRACTS	√	√	√				√		√	√		
ICE CREAM AND PUREES	√	√								√	√	
Water Ices												
MEAT AND POULTRY PRODUCTS												
OLEOMARGARINE												
PHARMACEUTICALS	√											
Dental and Oral Preparations												
PUDDINGS AND GELATINE DESSERTS	√	√	√									
SYRUP MANUFACTURERS	√	√	√						√	√	√	
TOBACCO			√				-					

									√					
√	√		√				√					√		
√	√					√	√					√		
√	√		√			√	√					√		
			√											
√						√	√					√		
						√	√					√		
		√	√				√							
√												√		
√						√								
	√													
√						√								
		√	√			√	√							
		√	√				√							
		√	√				√							
			√			√	√							
			√				√							
								√						
										√				
		√	√			√	√							
√														
√						√						√		
		√					√							
						√								
										√		√		
				√				√				√		
						√		√				√		
√														
					√									



The quick reference, flavor-selector chart reproduced on these pages is but one of the many informative features to be found in the new D&O REFERENCE BOOK and CATALOG of FLAVORS and SEASONINGS. For your free copy of this 68-page manual, write to:

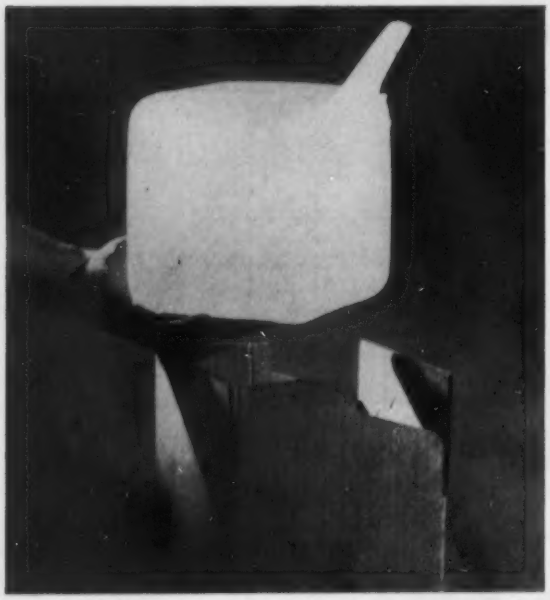
Dept. FSA-456

DODGE & OLCOTT, INC.

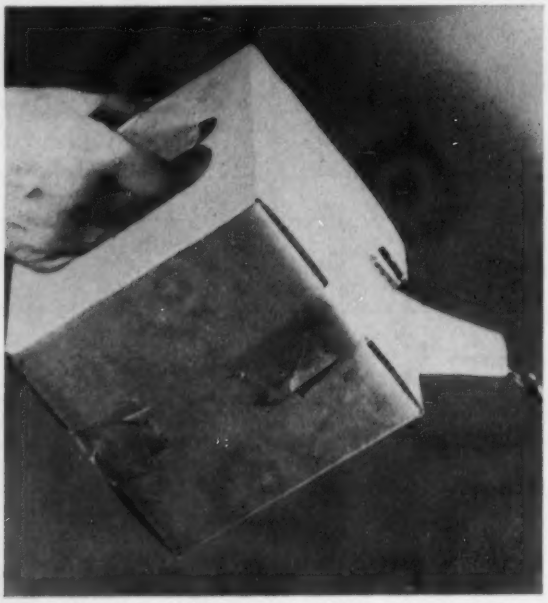
180 Varick Street, New York 14, N. Y.

Sales Offices in Principal Cities

NEW PACKAGES & PRODUCTS



"CUBITAINER" displayed by Bakelite is a semi-rigid polyethylene insert and a cardboard carton.



POURING from shipper is simplified with projecting spout. Note hand slits at side of carton.

Packaging Show Focuses on Future

Over 28,000 members of industry flocked to last month's Packaging Exposition at Atlantic City, N. J. to view the latest in equipment, materials, and applications.

Aluminum Corp. of America gave packagers a look at food packages of the future. Keynote of the packages was convenience for the consumer.

▶ Frosting or pancake mix is packaged in an aluminum foil bag inside a tubular container. Bag is attached to a nozzle at one end of the tube and a revolving collar at the other end. Turning the collar twists the bag inside the tube, forcing the batter out.

▶ Biscuits, individually foil wrapped, insure the consumer against waste by allowing use of only the exact amount needed. Biscuits are baked in their wrappers, which open when the biscuit is browned.

▶ Butter is ready for the table in a rigid foil container. Top is removed to reveal the ¼ lb. unit on an anadized foil tray.

▶ Shortening dispensing is also solved with a self-measuring shortening container. This is a tube with a tear tape fitted inside three sides of the box. Pulling the tape extracts the shortening from the container.

▶ Bacon offered two packaging possibilities. In one the slices are packed in a shallow foil pan. The pan itself is placed on the stove, avoiding the problem of dirty frying pans. In another design, bacon is packaged in a continuous roll of foil. The consumer pulls out the amount of bacon required, then tears it off.

▶ Hamburgers are packaged in a shallow pan to be discarded after use.

Visitors viewed bags of colored polyethylene at the Central States Paper & Bag Co. booth. A recent development in packaging, the opaque material lends an attractive touch to food products that do not emphasize visibility as a sales feature. (150A)

A new package composed of a foil bottom and a plastic lid was exhibited by Plax Corp. The plastic is Polyflex, Plax oriented polystyrene sheet. (150B)

Another Plax feature was polystyrene lids for use as closures on paper cups or cartons. This is useful when visibility is a prime sales factor.

The covers, made by Arvey Corp., are available in 10 sizes in round, rectangular, and square shapes. Foil cartons are by Ecko-Alcoa Containers Inc.

SALES-BOOSTING sleeves for sardine cans are made by Atlanta Paper Co.

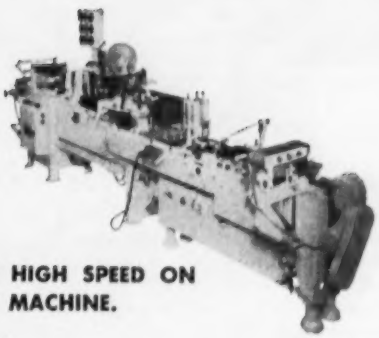
Poly' Cube Shipper

A novel liquid shipping container was unveiled at the Bakelite booth. Called Cubitainer, it is designed for one-time use. It consists of a polyethylene semi-rigid insert and an outer carton of corrugated cardboard.

Conventional equipment is used to inflate the insert and set up the carton. Filled by gravity or pressure, the insert is closed by heat sealing the end of the spout. Spout projects when the flap is opened, enabling the consumer to pour out contents without

PROTECTED BY RIEGEL

Q-T SNOW-WHIP FROSTING MIX USES HEAT-SEAL POUCH OF RIEGEL'S POLY-COATED LAMINATED AMBER GLASSINE.



RUN AT HIGH SPEED ON BARTELT MACHINE.

Protecting the sales-winning qualities of fine products is only one of the many functions of Riegel papers. Saving money is important, too. Riegel does it for you by creating the right combination of the most efficient packaging materials . . . and by "tailor-making" the paper to run and seal at high speeds on your machines. Tell us what you want paper to do for you. Riegel Paper Corporation, P.O. Box 170, Grand Central Sta., New York 17, N. Y.

PROTECTIVE PAPERS FOR PACKAGING

Riegel

GLASSINES AND GREASEPROOFS
Plain • Waxed • Printed • Lacquer-Coated • Laminated

For more data, circle this page number on card at back →

COOPER ALLOY

CORPORATION BRIEFS

• Edited by GEORGE BLACK

VALVE CLINICS

In spite of our belief that the Cooper Alloy stainless steel valve offers the best in design and operating features, we take it to school regularly. This "school" consists of continual study by field engineers, design engineers and by industry itself subjecting it to intensive examination and reporting their findings at organized Valve Clinics.

Cooper Alloy Valve Clinics have been held in dozens of leading plants, including Dow, DuPont, Mathieson, Celanese, Pfizer and many others. Arrangements for such a clinic in your own plant may be made through our Public Relations Division.

"FLEX-ALLOY" STAINLESS PUMP

A new line of stainless steel rotory pumps for corrosive solutions, abrasive slurries and fluids which must be kept free from contamination has just been announced by our Vanton Pump & Equipment Division. Called "Flex-Alloy" these new pumps in type 304 or 316 stainless (other alloys on request) incorporate the same no-stuffing box, no-shaft seals, no-gasket features of the popular "flex-i-liner" plastic pump series. Full details are given in Bulletin VP561.

FAST AND COLD

On October 14, 1947, the Bell X-1 made history by flashing through the skies faster than sound. Cooper Alloy is proud to have been teamed with the Glasby Company in helping Bell Aircraft carve its notch in history by furnishing the 30" diameter, 3" wall stainless steel sphere required for handling the liquid nitrogen.

COOPER ALLOY
CORPORATION • HILLSIDE, N. J.

disassembling the unit. A handle slit is cut on the carton side. (152A)

Snug-Pak, a new moisture-proof plastic film, appeared at the Tee-Pak Inc. exhibit. Food products were wrapped in the film and then dipped in a hot water bath (180-200 deg. F.) or subjected to dry heat. The film shrinks to form a contour-tight casing. (152B)

The result of research teamwork between Specialty Papers Co. and Goodyear Tire & Rubber Co., a new film-paper lamination was displayed at the Exposition. The lamination is produced by stretch-bonding Goodyear's Pliofilm to paper and board. (152C)

New combination is reported to have good dust, scuff, grease, and stain resistance. Also, the stretching operation produces more feet per lb. than other films, according to the manufacturer.

Goodyear also exhibited a tapered Pliofilm bag for grated cheese, providing good protection against moisture.

Versatile Mylar was demonstrated at the Du Pont exhibit as a heat-sealed overwrap for trays. Benzyl alcohol is used as an activator. (152D)

Sardines in a Sleeve

An attractive sleeve-type carton, designed to boost sales appeal of the standard sardine cans, was demonstrated by Atlanta Paper Co. Holding six of the cans, the sleeve has a sturdy locking construction and provides three advertising surfaces instead of the usual one. (152E)

Gardner Board & Carton Co. demonstrated the Hermetet system of packaging—a Swedish-developed method of making cartons with heat-sealed inner liners. Instead of the "bag in a box" type of liner, these are an integral part of the carton. Characteristics are flexibility, small size, moderate cost, wide choice of liner materials, heat sealing of side seams, and easy reclosing of cartons. (152F)

Marathon Corp. offered bakery trays and cartons closed with "pressure seals". The adhesive bonding prevents locking difficulties and "play" in the carton. Label surface is reported better protected than with locked cartons or trays. (152G)

Monsanto Chemical Co. introduced a new styrene molding compound that offers a high degree of optical clarity in a durable, tough plastic. Called Lustrex Hi-Test, a material is directed at food packaging. (152H)

Still another Monsanto item—clear goblets of Lustrex styrene. These may be used to package shrimp, cottage cheese, etc. Attractive and durable, the goblets also have a re-use value to the consumer.

Circle key numbers on Reader Service Card

Newest Single Service Dairy Shipping Carton

Latest entry in the disposable carton vs. standard cans for bulk milk handling contest is Liqui-pak, a single service package made by Chase Bag Co.

Now used by Producer's Creamery Co., Springfield, Mo., the carton consists of a waterproof Freezurboard box and a Chase Polytex liner. The box, shipped flat, makes up into a 9x9x19 in. carton with a special lock bottom and 4 flap top. Two corresponding flaps in the top are notched to leave a 2½ in. sq. opening when flaps are closed.

The liner is 34 in. high and made of seamless, pinhole-free polyethylene tubing. It is flexible enough to conform to the shape of the carton interior but its 3-mil weight gives good product protection.

No special equipment is needed for filling and closing. Also, since tare weight is always the same, contents may be held within a less-than-2 oz.-variation.

To fill, the Polytex liner is inserted in the carton. The bag top is held around the spout. Since bags remain flat until filled there is little air displacement, making it unnecessary to use long filling spouts.

When the desired weight (50 lb. of 40% cream; 55 lb. of condensed) is reached, filling corner of the bag is tightly tied off with a wire twist. A cord with 6 in. long ends is looped around this portion of the bag just below the wire. The cord ends protrude from the cover when the box is firmly sealed with gummed paper strips.

Advantages of the new bulk shipper are similar to earlier cartons: space and weight savings, increase sanitation, economy.

Circle 1521 on Reader Service Card

Another famous brand name cuts packaging costs with STOKES & SMITH Automatic Fillers!

At McCormick & Company, Inc.

Stokes & Smith Model HG-86-87 Automatic Tandem 4-Station Fillers have increased average accuracy of fill to consistently close tolerances. From "fluffy" cinnamon to "oily" nutmeg, they fill 120 or more containers per minute in a range of volumes from ½ to 4 ounces.

Whether your product is a sticky powder, free-flowing granules or hard-to-manage flakes, the versatile Model HG-86-87 Automatic Filler will reduce your packaging costs by increasing accuracy of fill at high speed. It fills cans, jars or cartons by volume, gross weight or auger-vacuum in sizes ranging from 1½" to 6" wide, 1½" to 4" thick, and 1½" to 8" high. It is ideally suited not only for spices and other foods but for drugs and cosmetics as well.

5 Cost-Cutting Advantages

Average Accuracy — plus or minus 1% for most products.

Versatility — handles a wide variety of products.

Adjustability — quick, easy changeover from one product or container size to another.

Speed — up to 145 containers per minute.

Cleanliness — auger, hopper, dust tube design assures dust-free fill.

For further details and specifications, write to:

STOKES & SMITH CO.

4914-Y SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

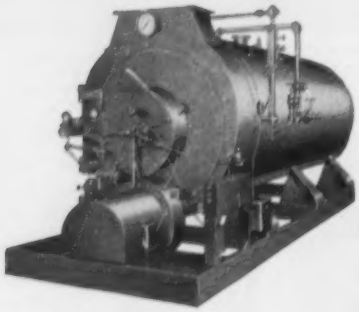
Pacific Coast: SIMPLEX PACKAGING MACHINERY, INC., 534—23rd AVE., OAKLAND 6, CALIF.

SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

For more data, circle this page number on card at back →

COUNT' EM!

CYCLOTHERM
CUTS
STEAM PROCESSING
COSTS 3 WAYS!



1. FUEL COSTS Cyclotherm Cyclonic Combustion means just what it says — controlled fuel and air, whirling at 200 mph, forming a cyclone in the furnace! This high velocity burning assures maximum efficiency in combustion and heat transfer, resulting in lower fuel consumption.

2. MANPOWER COSTS A fire without a fireman! Electronic controls operate the Cyclotherm safely and automatically. Smaller models cycle on and off as steam is required. On larger models, precision modulation coordinates the fuel-air ratio to the load demand, from 30% to 100% of rated capacity.

3. INSTALLATION AND MAINTENANCE COSTS Cyclotherm is factory assembled and factory pre-tested. All you do is make five simple connections. 50% maintenance savings are not uncommon. Return tubes cleaned in minutes with no removal or replacement of refractories. No standby unit needed.

And remember—one-third smaller than ordinary generators of similar capacity, a Cyclotherm fits almost anywhere. Many plants have installed two Cyclotherms for utmost flexibility and power. Burns gas or oil with quick changeover. 10 to 500 hp, 15 to 200 psi.

Cyclotherm Division,
National-U. S. Radiator Corp.
3020 E. First St., Oswego, N. Y.

Please send me a free copy of your booklet giving full information on Cyclotherm Steam and Hot Water Generators.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

Poly'-Dressed Crabs

Reported as a "first" by the processor, cooked and frozen crab is packaged in polyethylene film by Ivar Wendt, Seattle.

Sold under the Pacific Pearl label, crab is of the Pacific Dungeness variety. It is cooked in fresh water, placed in a brine solution and frozen. It is then placed in the poly' bag which is heat sealed.

Film used is Visking Corp.'s Visqueen.

Circle 154A on Reader Service Card

Carry-Home for Wine

Latest entry in the handy carrier field is Robert Gair Co.'s carton for Opici Winery, Alta Loma, Calif. The carrier holds 4 12.8 oz. bottles of wine, 2 of Burgundy, and 2 of Sauterne. Each bottle holds sufficient wine for dinner for two.

Novel packaging of wine is directed at encouraging impulse buying, particularly among the younger married groups.

Design, printed magenta on white, is distinctive from any being used in the beverage carrier field.

Circle 154B on Reader Service Card

Chop Suey for 5

A jumbo family-size package of frozen beef chop suey is now distributed by Mah Chena Corp., Chicago. A foil-wrapped carton holds 2 lb. of the Chinese specialty.

The large package will supplement the processors regular 1 lb. size and a 4 lb. institutional pack. The new family size serves five people.

Ice Cream Bars in Foil

Two ice cream bars have recently appeared in glittering new foil dress.

Eskimo Pie Corp., Baltimore, uses Foiline in its new 4-bar carry home carton. Printed in blue, red, yellow, brown, and white on silver, the cartons are made by Robert Gair Co., Inc. (154C)

Gold Mine ice cream bars are appropriately packaged in fold foil bags. Made by Doughnut Corp. of America's Ice Cream Division, the bar is coated with a special-formula chocolate. Foil bag is produced by Milprint, Inc. (154D)

The box has a tuck top and Quick-loc bottom.

Circle key numbers on Reader Service Card

Apple Chip Cake Mix

Newest flavor in Swans Down's instant cake mix line is Apple Chip. The mix, in addition to standard ingredients, contains vacuum dried apple chips. Fresh eggs and water are added in preparation.

Standardizing Packaging Saves Manpower, Space

Adoption of a standard 4 x 12 in. folding carton tray has resulted in saving enough warehouse space for a carload of flour and over 40 man hours per week for National Biscuit Co.'s Houston bakery.

The carton replaces three separate types used perviously to package ten varieties of hamburger and frankfurter rolls. The new container has the same dimensions as a loaf of bread and may be wropped interchangeably on the same machine without adjustment. Tray was developed by the bakery in conjunction with the Folding Paper Box Assn.

Circle 154E on Reader Service Card

Dietetic Caramels

Latest reducing plan introduced to consumers is Paul F. Beich Co.'s Slim-Vims. It consists of caramels containing only 25 calories each but supplying a full complement of the necessary vitamins and minerals.

Instructions suggest eating the caramels before meals, raising the sugar content in the blood and reducing appetite.

Individually foil-wrapped, the candy is packaged in a rectangular carton printed in brown and white.

Pinhole-Free Poly Film

Chase Bag. Co., Chicago, has introduced an exclusive new polyethylene film which is guaranteed pinhole-free. Made by fusing together two simultaneous draws of polyethylene while surfaces are still molten, the film has wide applications in bag, drum, box, and barrel liners. Lamination is known as Polytex-phf.

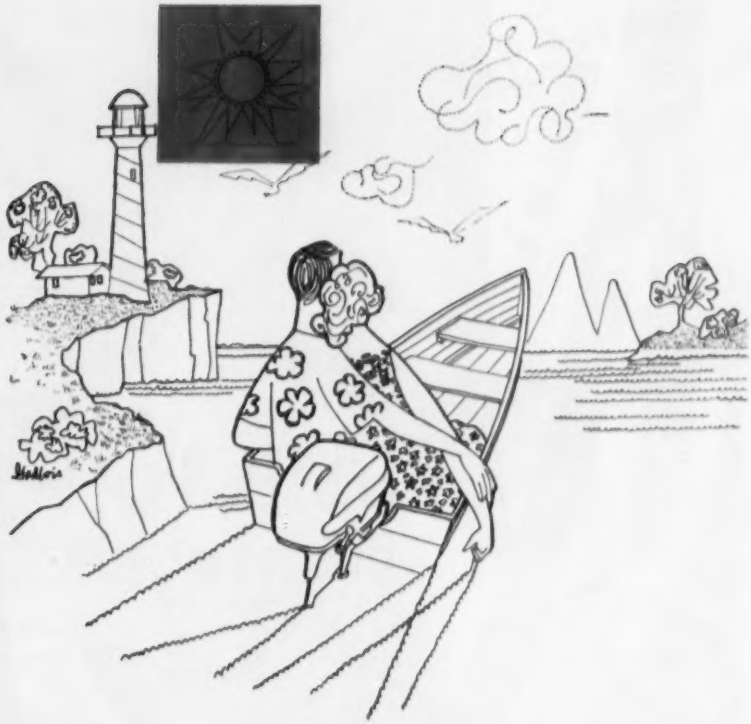
For Eraser Nibblers

Designed to make suckers out of potential customers is a unique promotional idea from Franklin C. Wertheim, Jamaica, New York. Lollypencils are ordinary pencils with the erasers replaced by a tasty lollipop. Designed for "eraser nibblers" the gimmick comes in six flavors: scotch, bourbon, rum, lemon, and raspberry. Booze flavors are artificial and non-alcoholic. Each pencil is cellophane wrapped.

New Product Shorts

Frozen Hawaiian Juices are distributed by P. J. Wegesser Co., San Francisco. Juices include passion fruit, guava nectar, and Hawaiian fruit.

Consumer-Size packs of Pasca Packing Co.'s concentrated citrus juice are now in process. Packaged in a 2-oz. cellophane



Hoerner Boxes, Inc.
has been keeping company with
Johnson and Evinrude Motors
for *16 years . . .*

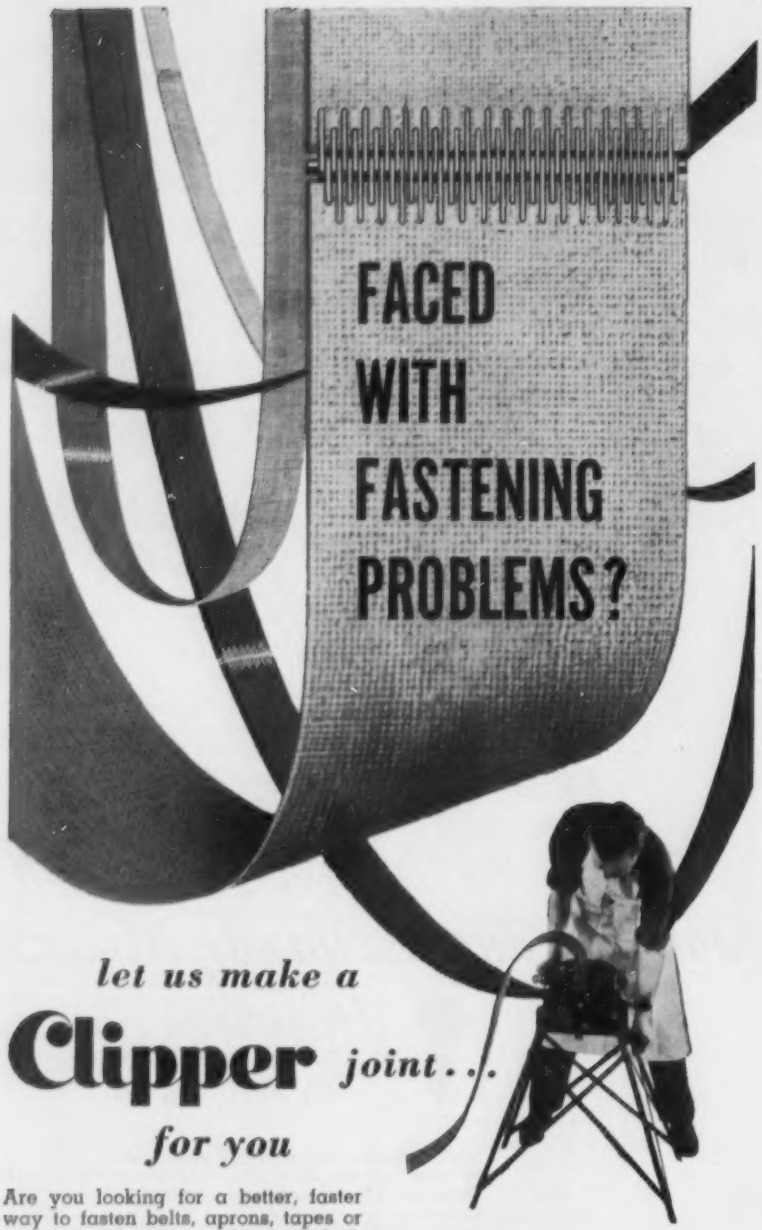
The packaging and shipping operations of these two manufacturing divisions of the Outboard Marine & Manufacturing Company sail along smoothly. Hoerner supplies the corrugated containers. Never a hitch in delivery. And outboards of Johnson Motors and Evinrude Motors arrive at the dealer's in the same ship-shape condition as they leave the factory.

We think you'll go overboard for Hoerner service after one conference with a Hoerner Packaging Engineer.

Just phone or write the office or plant nearest you.

HOERNER BOXES, INC.

GENERAL OFFICES—600 Morgan St., Keokuk, Iowa • PLANTS—Keokuk, Des Moines and Ottumwa, Iowa Sand Springs, Oklahoma • Minneapolis, Minnesota • Fort Worth, Texas • Sioux Falls, South Dakota Fort Smith and Little Rock, Arkansas • Cajas y Empaques Impermeables, S. A., Mexico City D.F., Mexico



let us make a

Clipper *joint . . .*

for you

Are you looking for a better, faster way to fasten belts, aprons, tapes or ribbons? Would you like to slash maintenance time by putting an easy-to-fasten joint in endless belts? The fastest way to join these ends is with Clipper Hooks and Lacers.

Long used for lacing power transmission belting, Clipper fasteners are now proving their cost-cutting value in materials handling equipment, automatic pin setters, laundry equipment, food harvesting and processing equipment and in many other applications.

They produce a smooth, flexible joint in a hurry.

Let us demonstrate the advantages of a Clipper joint on the product of your choice. Send us a small sample (or the complete belt, apron, tape, or what have you) and we'll make you a Clipper joint FREE, without obligation. Write, wire or call today for details and literature.

Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

988 Front Ave., N. W., Grand Rapids 2, Michigan

bag, the concentrate makes 8 oz. of juice when mixed with water.

Imitation Fruit Punch flavored beverage mix by Kool-Aid now goes into national distribution. Same processor's Kool-Shake, a powdered milk shake mix, is made in strawberry, vanilla, and chocolate.

Shredded Wheat Juniors are being tested in New York area by Nabisco.

Pancake Batter Mix is being distributed in the East by Cantrell & Cochrane Corp. Product is packed in 1 pt. waxed-paperboard containers.

Institutional Distribution has been announced for Danish-style frozen apple slices packed by Hart Cherry Packers, Inc. No. 10 can holds 7 lb. of sliced apples in heavy syrup.

Combination of beef and macaroni called Beefroni is newest Chef-Boy-Ar-Dee product of American Home Foods, Inc.

End

Mylar Packaging

—Continued from page 69

by Plymouth Rock Provision Co., New York.

Big interest at the show focused on automatic bundling of packages, as done with flavor extract cartons in the C. F. Sauer Co. plant in Richmond, Va., on a new Hayssen Mfg. Co. machine.

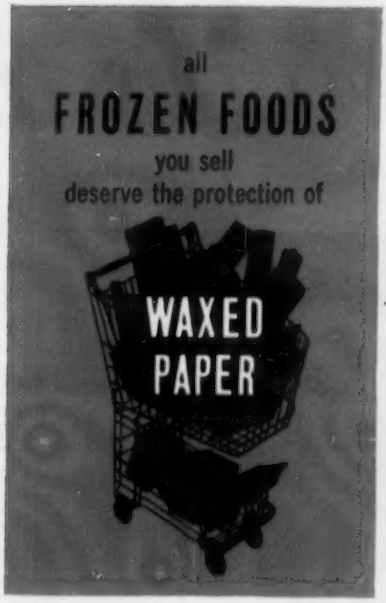
Successful bundling is possible because the film has great strength—and because it now can be readily sealed in a fast production-line operation. The bundle is unique, too, in that the containers show clearly through the overwrap.

Trays also were being overwrapped, at the show, on a high-speed Package Machinery Co. unit converted to seal the film.

Sealing is achieved by roller deposition of benzyl alcohol to condition the overlap areas, followed by application of heat at the "joints." Film temperatures of 335 to 385 deg. F. are required—the higher temperatures for high-speed operations. Sealer plates must be individually controlled within ±10 deg. F. And Teflon-impregnated glass cloth covers the sealer plates to improve seal appearance and prevent sticking.

Conversion of machines to handle and seal the Mylar also involves addition of two static eliminators, one after the film unwind point and the other between the feed rollers and cut-off knife. And on machines running 50-gage Mylar, a belt-and-ball feed mechanism is employed whenever the film limpness presents a problem.

End *(Resume reading on page 70)*



Processors' formula for frozen food profits:

More Sales Power Per Package ...with Waxed Paper

Best-dressed products pull sales, boost profits! Waxed Paper protects from processing to purchase and plate!

- **Display** Every pack sells itself! Waxed Paper pictures the product in full color realism, promises a grand table treat, makes shoppers reach out and buy!
- **Protection** Waxed Paper seals in and protects frozen freshness, flavor, texture, and nutrition. Assures uniformity of quality.
- **Durability** A really rugged wrap! Passes every tough test of shipping, zero-refrigeration, in-store and consumer handling. Eliminates returns, lost sales...everybody profits!
- **Brand Recognition** Superior reproduction turns Waxed Paper wrappers into point-of-sale pieces! Stand-out packages steer shoppers to *your* label, echo your advertising in the store—and in the home!
- **Low Cost** Lower initial wrapping costs team up with Waxed Paper advantages, pay off in higher *net* profits!

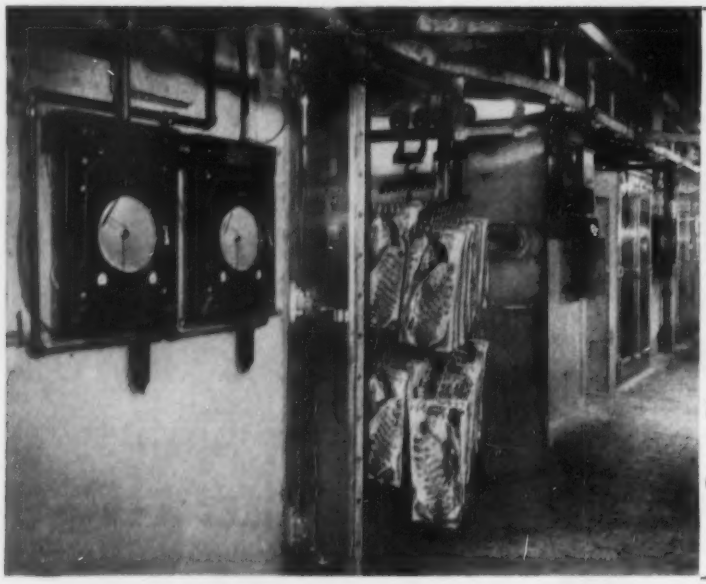
Put Waxed Paper to work for you. Find out how it sparks impulse buying, builds brand prestige, increases profits and sales. See your Waxed Paper salesman or write or telephone us direct.

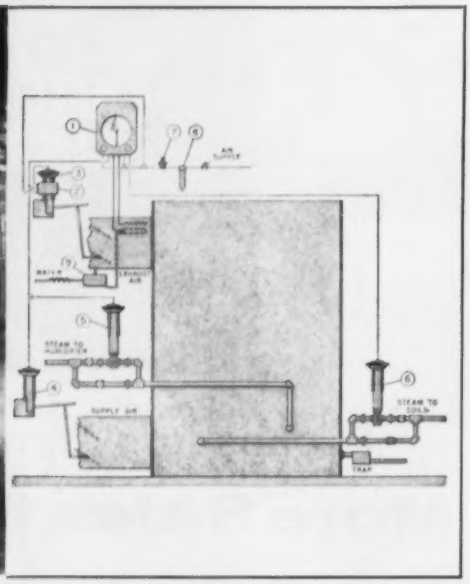
W PROTECTS FRESHNESS AND FLAVOR P

Waxed Paper Merchandising Council, Inc.
38 South Dearborn Street • Chicago 3, Illinois
Telephone: STate 2-8115

For more data, circle this page number on card at back →

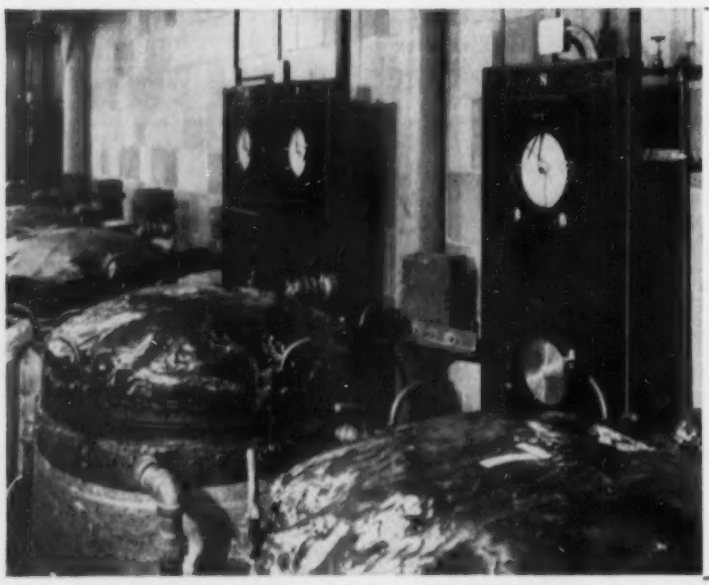
Control wins more

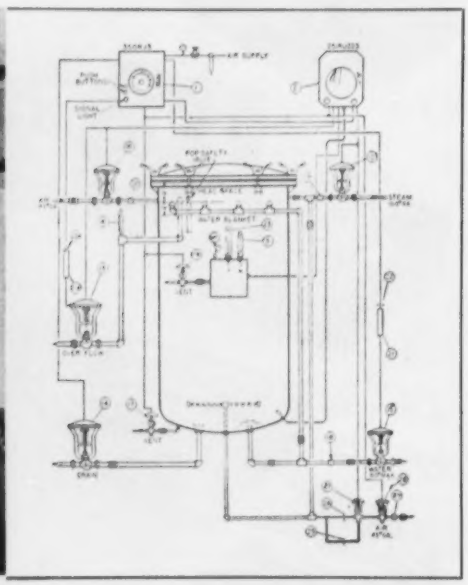




Taylor Smokehouse Control System keeps quality high and shrinkage low while cutting costs in this modern packing plant. A Taylor FULSCOPE* Recording Wet-and-Dry Bulb Controller holds air moisture where you want it, using a diaphragm valve in steam heater supply line and another on steam spray line. Controller automatically operates lever motor for fresh air intake and exhaust vents. Dampers in ducts from smoke unit to smoke house regulate smoke density.

*Reg. U.S. Pat. Off.





Taylor SWP7AV Retort System — with remarkable new versatility—gives completely automatic control for either steam or water cooking, with or without pressure cooling . . . can be changed from one to another in minutes.

New Taylor FLEX-O-TIMER* Timed-Program Controller teamed with time-proven Taylor FULSCOPE Recording Controller, readily adaptable to any existing variety of products, can be used for any type or size of container. Completely packaged.

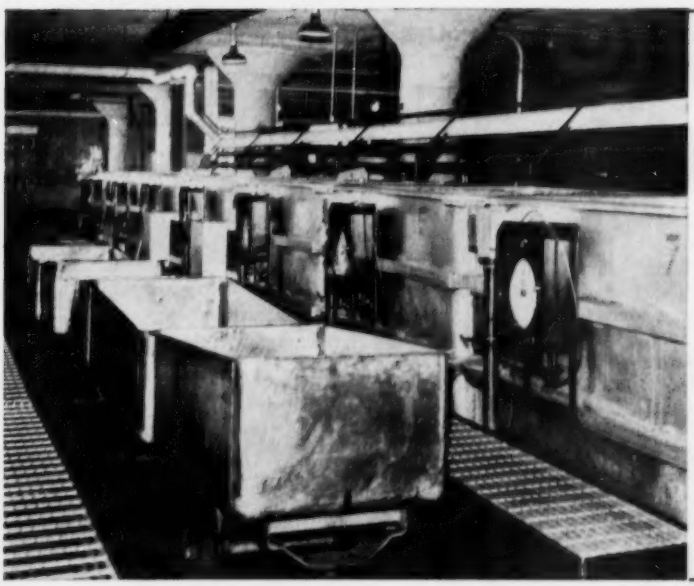
than Ball Games...

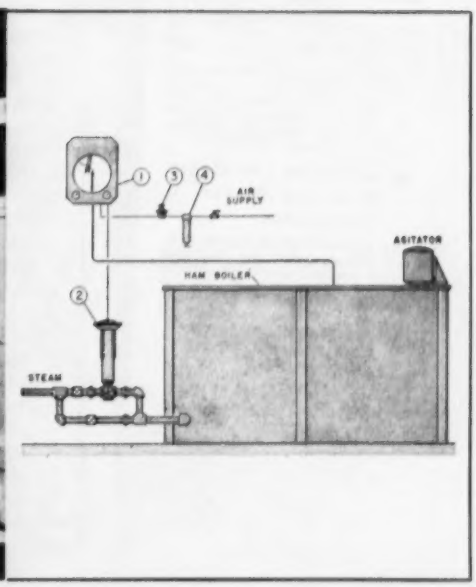
YOUR processing costs and worries have two strikes against them when Taylor Control Systems are in there pitching for you. Your year-end score card will show the money Taylor saves you . . . every man on the team will see the new ease and efficiency Taylor puts into your whole operation. Your good name—and your future business—will be protected by consistently high—*Taylor-ed*—quality.

Food plants all over America are gaining efficient, dependable records and control with Taylor Control Systems like those pictured here. Taylor also engineers systems for *Scalding Tanks, Dehairers, Depilators, Hot Water Systems, Washers, Casing Soakers, Ovens, Chill Rooms, Meat Cutters, Sausage Mixers, Jourdan Cookers, Lard Renderers, Coolers, Evaporators, and Air Conditioners.*

A Taylor Automatic Control System many times will pay for itself within the first year through savings in operator time alone. Talk to your Taylor Field Engineer . . . or write for **Catalog 500MP.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

Taylor Instruments
MEAN ACCURACY FIRST





Taylor Ham Boiler Temperature Control System means minimum shrinkage because processing temperature is automatically kept just where you want it; means uniform product because every ham is boiled at the same heat; means lower operating costs because steam consumption and operator time are reduced. Taylor FULSCOPE Limited Range Recording Controller does this—*and* gives you an accurate record of each batch's boiling time and temperature.

KLENZADE

COMPLETE SANITATION PROGRAMS For All Food PROCESSING PLANTS

★ Tops for Tough Cleaning Jobs

Klenzade "CBS" Cleaner is the finest industrial detergent available. Superb balance and high wetting agent content provide excellent soil penetration, fat emulsification, and free rinsing.

★ High Temperature Cleaning

Klenzade Flash-Kleen is ideal for steam cleaning jobs. Strips "baked-on" soil residues quickly with the Klenzade Steam Cleaner.

★ Controlling Mineral Deposits

Klenzade Flash-Klenz removes and prevents lime film on canals, troughs, fillers, chutes, etc. Use the Klenzade Alternate System of Cleaning employing alkaline and organic acid detergents.

★ Chlorine Sanitization and Water Treatment

Use Klenzade XY-12 Liquid Sodium Hypochlorite for thorough fast action. Control-packaging in ready-to-use solution. No predissolving — no "pin-point corrosion." Choice selection of chlorine application equipment.

Plant Sanitation Surveys On Request

KLENZADE

"ALL OVER AMERICA"

KLENZADE FIELD SERVICE

A Klenzade field service technician will gladly call on you and help you plan a complete plant sanitation program.

KLENZADE PRODUCTS, INC.

Offices in Principal Cities

BELOIT, WISCONSIN

Improved Vanilla Making

—Continued from page 93

the third about 15%. Take-off of all the extractives should be in a continuous, slow flow. Finally, the remaining material should be washed with water, then pressed or centrifuged.

Part of the wash water is used to reduce alcohol content of the combined extracts to a suitable strength for aging. (For unexplained reasons, an alcohol content of 42-45% accelerates the chemical changes and formation of esters from acids during aging.) Six months can be considered the minimum aging period.

Remainder of wash water should be stored in a cold place and used to reduce strength of aged extract to commercial standards. The aromatic fragrance of the extract tends to become more pronounced by this reduction in strength.

Pinpointing the Process

It has been determined that 2 lb. of beans per gallon of final extract will produce the most satisfactory and economical distribution of flavoring values.

Before they are extracted, it is necessary to reduce the beans to the smallest possible state of subdivision. But prior to reduction, they should be washed in the alcoholic menstruum that has been prepared for use in the first extraction. This dissolves and recovers vanillin and aromatic substances from the surfaces of the beans.

Reduction is best accomplished by a comminuting machine in at least two operations. Menstruum prepared for the first extraction should be fed to the cumminuter together with the beans.

This prevents over-heating during cutting and thus eliminates volatilization of flavor. It also facilitates instantaneous extraction during the reduction.

Reduced beans should be separated from the menstruum and spread on the perforated trays of the extractor. Prior to this, filter cloths are inserted in bottom of trays. As many trays as possible should be placed in the extractor in order to expose the greatest possible area of beans to the solvent.

Menstruum is made to flow uniformly from tray to tray over the entire surface of the beans, and should cover them during the flow and recirculation of the extract.

When the above procedure is followed carefully, the maximum amount of flavor is extracted from the beans.

Solvents to which alkalis are added produce higher color and lead numbers. But they impair the natural fragrance of the aromatic compounds of the beans.

Sugar does not augment the flavor or the color of the extract. Glycerine increases the color and, also, gives gravity and sweetish taste to the extractive.

A word of caution concerning equipment used in the process: Vanilla has quite a solvent action on copper, nickel, aluminum, lead, and zinc. Stainless steel and tin are, therefore, the most practical metals for containers to be used for vanilla extraction and storage.

End (Resume reading on page 94)

Dairymen's Conference

—Continued from page 88

like acid and gas formation, also promote ropiness.

Further, they surface-taint butter (after about 10 days at 41-F. storage). And with cottage cheese, they cause loss of flavor and aroma, while producing a slimy, liquefied-surface condition.

Now the remedies: (1) Complete, adequate pasteurization; (2) proper sanitizing of equipment and utensils; (3) check of re-contamination; (4) application of 5 to 10-ppm. cl_2 water on equipment, utensils, etc.; and (5) use of lowest practicable holding temperature.

Culture and Starter Failures

Employment of high-grade, pretest, and reconstituted skim milk solids sustains the activity of lactic cultures for cheese-making, reported M. W. Hales, U. of Wisconsin.

Most important cause for culture and starter failures are phages that develop on living cells, reproduce at terrific rates, and lie dormant over long periods.

To control them: Change lactic cultures, use different ones on a rotation basis, sanitize, and employ the most protective-type equipment.

Fat-Loss Control

Average fat losses may run around 2%, according to H. F. DePew, National Dairy Products, Inc., New York City.

For a plant handling 200,000 lb. of milk a day, this fat loss could run up to $40,000 a year!

According to some thinking, the percentage here could be reduced to 1, 1¼, or 1½. Suggested was a fat loss-control program covering such matters as receiving, processing, and accurate and complete records.

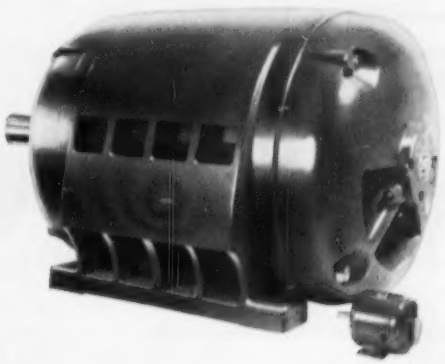
End (Resume reading on page 91)

You Name It—Thousands of Ratings

From 1/8 to 400 H. P.

See MASTER for a selection of motor drives that you can get nowhere else—for specialized power drives unequalled for flexibility, compactness and performance. See Master for the right horsepower, right shaft speed, right mounting features—to add salability to your products, efficiency to your plant equipment.

Master components are designed to combine in one compact unit to suit your needs exactly—all the way up to 400 H. P. Just ask us for information.



Motor Ratings	⅛ to 400 H.P. All phases, voltages, and frequencies.
Motor Types	Squirrel cage, slip ring, synchronous, repulsion-start induction, capacitor, direct current.
Construction	Open, enclosed, splash-proof, fan-cooled, explosion-proof, special purpose.
Speeds	Single-speed, multi-speed, and variable speed.
Installation	Horizontal or vertical, with or without flanges and other features.
Power Drive Features	Electric brakes (2 types)—5 types of gear reduction up to 432 to 1 ratio. Mechanical and electronic variable speed units—fluid drives—every type of mounting.

THE MASTER ELECTRIC COMPANY
Dayton 1, Ohio

MASTER ELECTRIC MOTORS

INSIDE SCIENCE

The Vital Story of Vitamin B_1

(Thiamine)

by Science Writer

History. The discovery of vitamin B_1 resulted from research into the cause of beriberi. Almost 50 years passed between Eijkman's discovery of the relationship of the disease to diet and the famous work of Jansen and Donath who first isolated the crystalline vitamin from rice bran.

Within ten years of that first isolation the vitamin's chemical structure was determined and it was successfully synthesized.

Eijkman's work resulted in the development of a theory that beriberi was caused by a lack of some factor in the diet and not by a toxin or infectious agent. This idea was not readily accepted until the growth of dietary knowledge proved it correct.

Isolation and Synthesis. In 1926 Profs. Jansen and Donath accomplished the isolation of crystalline vitamin B_1 from rice bran. In 1931 Windaus and co-workers successfully isolated pure vitamin B_1 and established its empirical formula.

In 1936 R. R. Williams, and independently R. Grewe, explained the vitamin's chemical structure. That year, R. R. Williams and J. K. Cline accomplished the synthesis of thiamine which is in wide use today. Andersag and Westphal also synthesized the vitamin in 1936. Another synthesis was described by Bergel and Todd in 1937.

Photomicrograph of B_1 crystals

Chemical and Physical Properties. Thiamine hydrochloride is white, water soluble, with a nut-like, salty taste and yeast-like odor. Its empirical formula is: $C_{12}H_{17}ClN_4OS \cdot HCl$. Thiamine produced by synthesis is identical chemically and in biological activity with that obtained in pure form from nature.

Deficiencies. A deficiency of thiamine is characterized by these symptoms: depression, irritability, fearfulness, lack of initiative and interest, loss of appetite. Symptoms vary since in usual practice deficiencies of other water-soluble vitamins occur. Medical treatment is simple: a sufficient amount of thiamine is administered to relieve symptoms quickly and the physician provides for a continuing adequate intake.

Beriberi victim

A severe deficiency of thiamine leads to beriberi, a serious and sometimes fatal disease. While beriberi is almost a medical curiosity in the United States, it is common in countries in which polished white rice is a staple of the diet.

Human Nutrition Requirements. Thiamine is one of the nutritive elements the human body needs daily and does not store in quantity. The minimum daily requirements established by the U. S. Food and Drug Administration for the prevention of symptoms of thiamine deficiency disease are:

Adults	1.00 mg.	Children (1-5 incl.)	0.50 mg.
Infants	0.25 mg.	Children (6-11 incl.)	0.75 mg.

The Food and Nutrition Board of the National Research Council recommends the following dietary intake of thiamine for healthy persons in the U. S. A.

Recommended Daily Intake in Milligrams

Age	*Men*	*Women*
25	1.6	1.2
45	1.5	1.1
65	1.3	1.0
Pregnant (3rd trimester)		1.5
Lactating		1.5

The Council recommendations for infants and children vary below and above these figures, based on age and sex. Various illnesses and stress situations can exhaust vital reserves of thiamine. So, for the physician, vitamin B_1 is prepared in various dosage forms and potencies for therapeutic and prophylatic use.

How do human beings receive thiamine? It is widely distributed in foods of animal and vegetable origin, particularly cereal grains and dry legumes. Because of public demand for refined products which millers must meet for obvious economic reasons, a loss of thiamine and other factors occurs during processing. The thiamine loss is overcome through the use of *enrichment* in cereal grain products for which Federal Standards exist, or in other foods such as breakfast cereals, by *fortification* or *restoration*. When enriching, fortifying or restoring, the food processor adds the necessary amount of pure thiamine (and other vitamins and minerals) to the food so that the finished product meets Federal, state and territorial requirements or contributes to the consumer an amount of the vitamin which dietary experts believe significantly useful.

Thiamine is extensively used for the enrichment of cereal grain foods such as white flour, white bread and rolls, macaroni products, farina, corn grits and meal, milled white rice. The story of these uses is delightfully told in a separate brochure which is available on request for reference or educational purposes.

Production. Huge production facilities at the Hoffmann-La Roche plant in Nutley, New Jersey, deliver highest quality thiamine *by the tons*. Roche manufactures thiamine hydrochloride and thiamine mononitrate. These fine products, which equal or exceed U.S.P. specifications, are ideal for use by pharmaceutical makers and food processors. Years of experience in research and manufacture have made Roche the leader in vitamins.

This article is published in the interests of pharmaceutical manufacturers, and of food processors who make their good foods better with essential, health-giving vitamin B_1. Reprints of this and others in the series are available on request. Write the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec.

ADVANCES IN TECHNOLOGY

Flavor of Italian Cheeses

Rate of formation and concentration of free butyric acid (also flavor development) in Italian cheeses is directly related to type of enzyme product used in their manufacture.

This was determined by a series of experiments in which 8 vats of milk were treated with 4 different enzyme combinations and made into 4 lots each of Provolone and Romano cheese. Cheese was stored for 1 yr. at 50 F. and tested at various times for flavor, propionic, acetic, butyric and free amino acids.

Cheeses made with kid gland enzyme, and with kid rennet paste showed greatest intensity of flavor and butyric acid development. Those made with rennet extract showed very little flavor and butyric acid.

The four enzymes produced practically the same amount of propionic and acetic acids. Free amino acid values were not identical but could not be related to kind of enzyme product used.—*Journal of Dairy Science*, 245-52, March, 1956.

Filled Milk Cheese Lacks Flavor and Texture

A satisfactory milk for cheesemaking can be obtained by homogenizing natural or reconstituted skim milk with vegetable fat at 130 F. using 500 psi. pressure both before and after pasteurizing.

Flavor of resulting cheese does not compare with that of ripened cheddar, and its body is curdy and crumbly. Addition of monostearine did not improve these qualities, but sweet cream buttermilk powder seemed to help the flavor and texture.—*Food Technology*, 138-41, March, 1956.

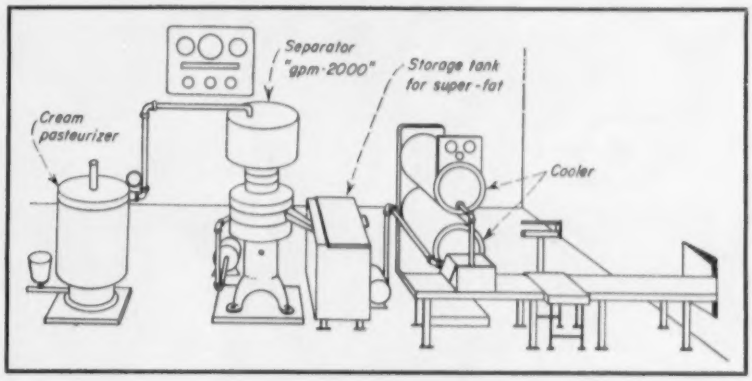
Concentrated Soup Mixes

Novelty is claimed for a patented process for making vegetable soup concentrates, particularly beet borsht which, upon the addition of water, form ready-to-eat soups.

Among advantages claimed for the product are: (1) It can be packed cold; (2) it will retain natural color and flavor for long periods of time, and (3) it will not deteriorate despite not having been pasteurized.

Crux of the process is addition to cooked and diced beets of a dehydrated beet powder prepared from raw beets. Sugar, salt, and citric acid also are added, and such optional ingredients as sour cream. The raw beet powder imparts color and flavor to the finished product.

In parts by weight, proportions of essential ingredients are: Sugar, 40-60; salt, 6-10; cooked beets, 30-40, uncooked beet powder, 2-4. Five ounces of the concentrate added to 1 qt. of water will make a soup of desired character.—U. S. Patent 2,731,-351, Jan. 17, 1956.



Continuous Buttermaking Process Developed by Soviet Institute

A "new" continuous buttermaking process, which closely resembles the German Alfa-Laval (*Food Ind.*, June '46, p. 75), has been developed at the Central Institute of Dairy Industry, Moscow and is said to be used in more than 150 factories in Russia.

The method, known as Meleshin's process, is based on production of "super-fat" (80-83%) cream which is passed through a cooler that converts it to butter.

In the original process, super-fat cream was produced directly from milk by a special separator, the SPM-2,000, which operates at 7,200 rpm. In most plants, however, a second separator is employed to produce 40% cream, which is heated to 170 F. and fed to the SPM-2,000. In other plants processing begins with 35-45% cream.

No information is given on design of the cooler. From illustrations it appears to be comprised of two brine cooled cylinders mounted one above the other. Cream enters front of bottom cylinder and then discharges through rear. It enters rear of top cylinder and discharges as butter from the front.

Based on the year 1954 (first full year of plant operations) average production per plant was 280-300 kg. butter per hr.—*Dairy Industry* (Russian publication), 1953, No. 3, 1954, No. 4, 1955, No. 1 per McGraw-Hill World News.

Digestible Starch Casing

Seamless tubing of amylose and amylopectin for encasing sausage and similar ground meat products is the subject of a recent patent.

Advantages of casing are its digestibility, and the fact that it will decompose in the presence of moisture yet has sufficient strength to withstand the stuffing process.

Formula for the casing will vary with a number of factors and will usually be determined empirically by experiment. In general it comprises 70-95% by weight amylose and 3-30% amylopectin. Minor proportions of glycerine, sorbitol, and the like may be used to soften and otherwise improve its properties. It can be formed by extrusion of the aqueous solution or by casting in a rotating horizontal metal cylinder having a highly polished interior.

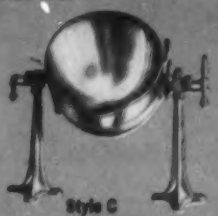
Strength of tubing can be increased by stretching to accomplish a degree of molecular orientation without tearing the film. When packed with

LEE
Corrosion-Resistant
PROCESSING EQUIPMENT

PRECISION BUILT OF STAINLESS STEEL
TO YOUR SPECIFIC REQUIREMENTS

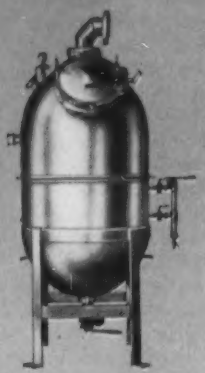
Style A
Two-thirds Jacketed
5 to 500 gal.

Style B
Full Jacketed
10 to 300 gal.

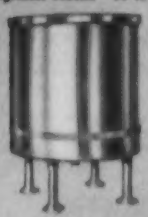

Style C
Two-thirds Jacketed
5 to 100 gal.

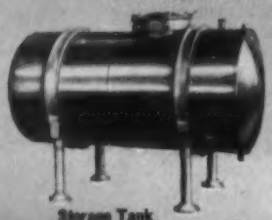
Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.

CWST
Center-line Scraper
Agitator Kettle—80 to 300 gal.


Vacuum Pan
50 to 500 gal.

Style CW
Two-thirds Jacketed
80 to 300 gal.


Pulp Tank
500 to 2,000 gal.


Storage Tank
100 to 5,000 gal.

Quick Cooling Pan
50 to 200 gal.

LEE
Technical bulletins fully describing these processing units gladly sent on request.

METAL PRODUCTS CO., INC.
416 PINE STREET, PHILIPSBURG, PA.
Designers and Manufacturers of
Corrosion-Resistant Processing Equipment
for over 25 years.

ground meat and cooked the casing tends to break up and cease to exist as a continuous film. The encased meat particles, however form a coherent mass.—U. S. Patent 2,729,565, Jan. 3, 1956.

Preservation of Eggs

Egg spoilage due to soiled shells is said to be prevented by a patented process and machine for implementing it.

Essential steps in the process are: (1) Removal of soil by wet sanding; (2) sterilizing the shell by rinsing with hot water or steam; (3) drying in a stream of air, and (4) coating with sprayed oil.

In order to avoid treating clean eggs, all are first viewed under the light of a mercury arc lamp having a cobalt glass shield. Clean eggs have a fresh pink color, whereas soiled ones vary in color from flat dead white to gold, depending on nature of filth.

Eggs are moved by spiral conveyors through the successive treatments. Sand and water slurry is applied for about 1 min. at 140 F. Sterilizing steam or water treatment lasts only a few seconds to avoid coagulating albumen, although the temperature may be 212 F. for as long as 3 sec.

At the oil spray nozzle hot sterile oil is either atomized with air or released under high pressure. In either case it is completely atomized and cooled to a temperature that will not adversely affect the eggs. Eggs thus treated have been stored for many months without loss.—U. S. Patent 2,733,150, Jan. 31, 1956.

Trapping Flavor Oils

Volatile flavor oils normally lost in vacuum evaporation of fruit juices are economically recovered by a recently patented invention.

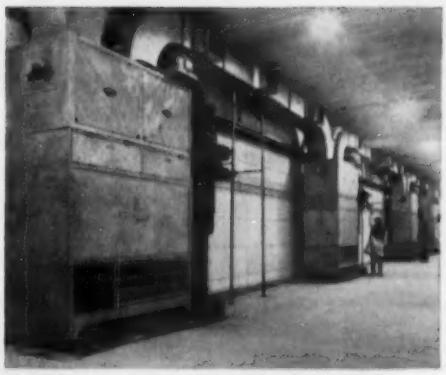
This is accomplished by contacting gases evolved from concentrator's surface condenser with a refrigerated hygroscopic solution of an electrolyte immiscible with the flavoring oil. Water in the gas is absorbed by the solution, and the oil is condensed on its surface.

Recommended absorber is of falling film type internally refrigerated to between +10 and −10 F. Hygroscopic solution (30-50% $CaCl_2$ for example) is recirculated continuously from large reservoir in unit's base. To maintain desired concentration, a part of diluted solution is continuously withdrawn, concentrated and returned.

Reservoir has restricted top portion in which solution level is carefully controlled. This enables the small volume

EXPERTS LIKE TO DO BUSINESS WITH EXPERTS

HAWAIIAN PINEAPPLE CHOOSES CARRIER AMMONIA REFRIGERATION



When the world's foremost experts in pineapple processing needed help in designing freezing facilities for their new Dole frozen pineapple products, they turned to the world's foremost refrigeration experts — at Carrier.

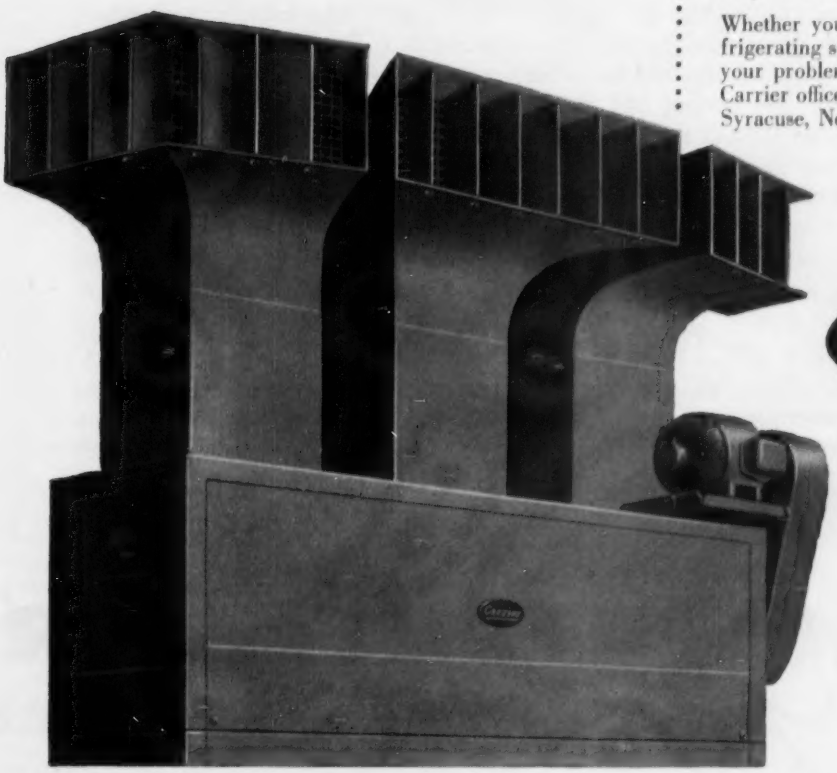
Result: a 24-hour-a-day freezing operation that utilizes numerous Carrier Ammonia Reciprocating Compressors plus batteries of Carrier Ammonia Cold Diffusers that push temperatures down to 40 degrees below zero.

Hawaiian Pineapple's Carrier-equipped plant in Honolulu is the world's largest for freezing pineapple products.

Carrier refrigerating equipment is on the job in food processing plants, large and small, all over the world—serving companies like Rath Packing Company, Waterloo, Iowa; Geo. A. Hormel, Austin, Minnesota; Minute Maid Corporation, Davenport, Florida.

May we assist you?

Whether you need a complete ammonia refrigerating system or a single machine, bring your problem to Carrier. Call your nearest Carrier office. Or write Carrier Corporation, Syracuse, New York.



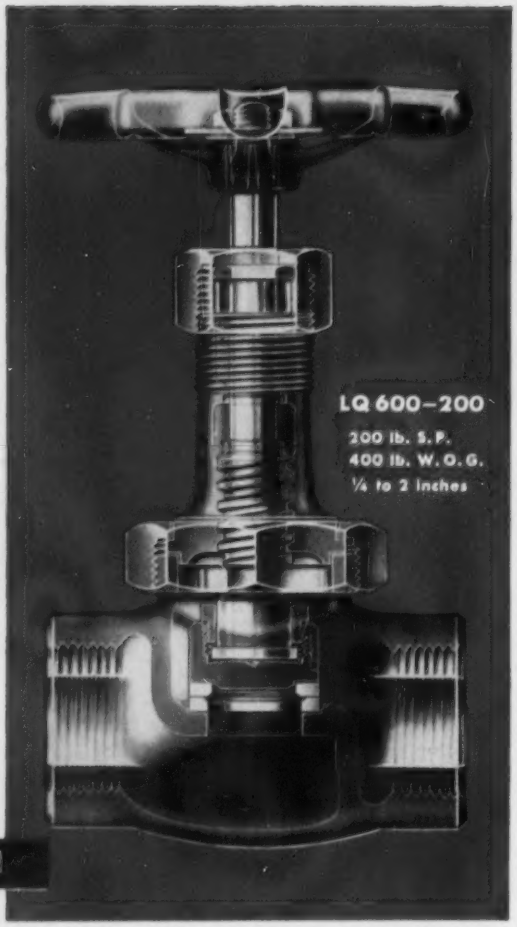
Carrier

ammonia refrigerating systems

For more data, circle this page number on card at back →

Lunkenheimer Announces

ANOTHER GREAT NEW LQ600 VALVE



200 Lb. S.P.! 400 Lb. W.O.G.!

Lunkenheimer's famous LQ600, the Bronze Globe Valve that set a new high standard of performance on 150 lb. service, is now available for 200 lb. S.P., 400 lb. W.O.G. applications. The new line features the same long-wearing flat seats and discs made of Brinalloy®, plus a body and bonnet of Lunkenheimer's amazingly strong S-1 Bronze for higher-pressure service. Install this great new LQ600 Valve on your 200-lb. pressure lines—including all your toughest services—and compare its performance with other valves. It's built to eliminate maintenance costs because there is no replacement of seats and discs—they are patented Brinalloy, brazed in to stay, harder all the way through and more resistant to wear and corrosion than 500 Brinell Stainless Steel and far exceeding the wear resistance of 1000 Brinell case-hardened Stainless Steel.

LUNKENHEIMER ® QUALITY

Now there are *TWO* LQ 600 Valve Lines

The original LQ600 Valve for 150 lb. S.P., 300 lb. W.O.G. service has received the fastest acceptance of any valve introduced in years. Thousands of these valves are in service—some as long as five years—without a single reported case of failure or leakage.

FOR COMPLETE INFORMATION WRITE....

The Lunkenheimer Company, Box 360, Cincinnati 14, Ohio, or get in touch with your Lunkenheimer Distributor.

BRONZE • IRON • STEEL • PVC

LUNKENHEIMER®

THE ONE *Great* NAME IN VALVES

L-256-27

of oil floating on surface of solution to occupy a large vertical distance. Oil may be decanted continuously and reincorporated in concentrated juice, or it may be removed and further treated. —U. S. Patent 2,729,564, Jan. 3, 1956.

Potato Chip Machine

A method and equipment for continuously making potato chips from sliced whole potatoes without removal of starch from the slices is the object of a recently patented invention.

Apparatus comprises a rectangular cooking tank with a longitudinal bulkhead extending approximately ½ its length, a mechanical slicer, a plurality of rectangular and circular perforated baskets, and a perforated, inclined discharge conveyor.

The rectangular baskets are cam-driven to produce a reciprocating motion longitudinally in one side of the tank. Circular baskets are on a vertical shaft near one end of tank and have means for automatically lifting them from the oil to clear bulkhead as they rotate.

Discharge conveyor, on opposite side of bulkhead, has one end submerged in the oil directly under the circular baskets. Movement of the various baskets causes the oil to move in a clockwise direction around bulkhead.

In operation, tank is filled with oil so baskets are immersed ¼-⅜ in., then oil is heated to desired frying temperature. Motor that operates all parts of equipment is started and potatoes are fed to slicer. Chips fall into hot oil and are moved by kicking action of rectangular baskets toward rotating baskets, which carry them around end of tank. At this point, the chips move onto discharge conveyor as baskets lift over bulkhead.

Chips drain as they move up conveyor, then, as they leave the tank, they go under a salter and, finally, are discharged to a suitable container. —U. S. Patent 2,726,597, Dec. 13, 1955.

New Agitator Cooker-Cooler

A new type continuous agitating cooker for acid foods has undergone several years of testing at Clemson Agr. College, Clemson, S. C. Tests here were confined to clingstone peach halves packed in 40 Brix syrup. Similar units have been employed for citrus juices, however.

Unit is composed of a horizontal rotating shaft or roller large enough to support cans to be processed. They are held in a horizontal position on

NEWS! Important beneficial ingredient in dry food mixes

Now! Where rapid solubility is vitally important, use quickly dissolving Kelco algin colloids in your dry food mixes to improve taste, texture and stability of the finished product.

Use Kelco algin in your dry salad and meat sauce mixes: Kelco algin, a superior emulsion stabilizer is now finding wider and wider use in acidic emulsions. It promotes complete and rapid solubility even when cold mixed.

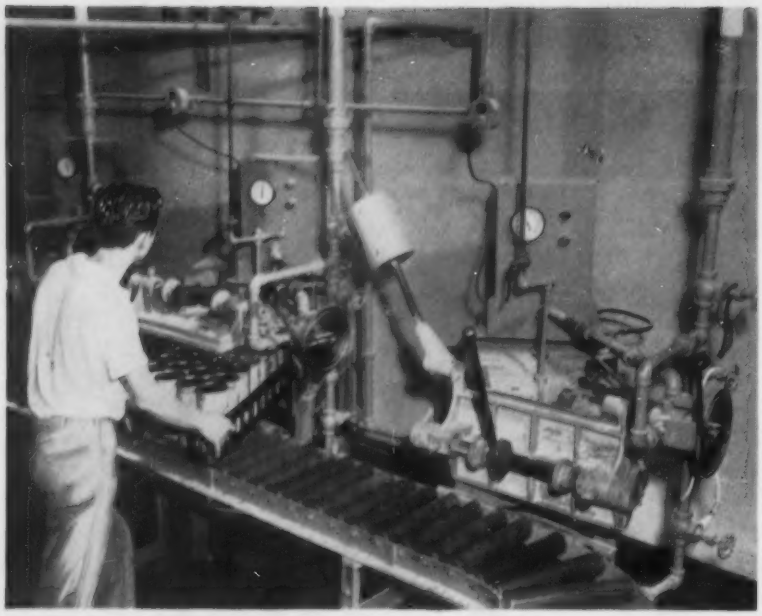
Use Kelco algin in quick mix puddings, gels and icings: The addition of Kelco algin enables dry mix puddings and gels to set up rapidly and firmly upon simple mixing with either cold or hot liquids. Water gels formed are clear and appetizing, while milk gels are creamier, smoother and tastier. Icing mixes containing this versatile algin are highly soluble and produce a finished icing with finer texture, softer body, and better moisture retention properties.

Yours On Request: "Technical Bulletin" fully describing the application of Kelco algin products in food uses. Without obligation, write for your copy today.

KELCO COMPANY

120 Broadway, New York 5, N. Y.
20 N. Wacker Drive, Chicago 6, Illinois
530 W. Sixth Street, Los Angeles 14, Calif.
Cable Address: Kelcoalgin — New York

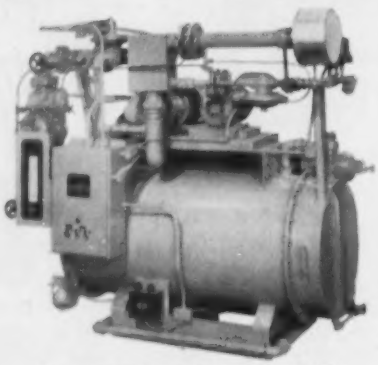
For more data, circle this page number on card at back →



Dry Milk Processor Protects Nutritive Value of Product with Gas Atmospheres System

Maple Island, Inc. protects the nutritive value and taste of their dry milk products for long periods of time through the ingenious system of eliminating oxygen from the product from the moment of its manufacture until the moment of use.

The heart of this operation is an inert gas system that guards against oxygen during the packaging process. To bring their gas cost to an absolute minimum, Maple Island, after a thorough study, selected a 500 cfh Gas Atmospheres Inert Generator with dryers and trace oxygen removal units. The entire system gives them a very dry, high purity gas, and according to Maple Island officials—it has required a minimum of maintenance over a four year period — and had actually paid for itself before it had been in operation a single year. Even though Maple Island has expanded their operations substantially, the original Gas Atmospheres unit gives them the flexibility they require. By running it during the off periods and compressing and storing the excess in tanks for use the next production day, they have not found it necessary to add further equipment.



Gas Atmospheres' XH50—500CFH Inert Atmosphere Generator of the type used by Maple Island to manufacture high purity gas composed of 88% nitrogen and 12% CO_2 completely void of oxygen. It is fully automatic in operation.

9904

gas Atmospheres, inc

equipment for producing industrial gases

30011 WEST LAKE ROAD CLEVELAND 16, OHIO

top of the roller by guide rails set at a small acute angle to axis of roller.

As roller and cans rotate, latter travel from one end of roller to the other. When unit is placed in steam chest it becomes a continuous cooker. When partially submerged in cold water and/or equipped with sprays it becomes a cooler.

Experimental unit employed at Clemson used a 4-in. standard steel pipe as the roller, and 2x2x¼-in. angle irons as guides. With No. 2½ cans, containing 21 oz. of peach halves, most rapid heating was obtained at 98 rpm.

Can center temperatures approached 200 F. in 10 min. in cooker maintained at 205 F. with steam from perforated pipes. Results indicate that for the above size can and fill, a cooking time of 5.7 min. is ample.—*Bulletin 429*, S. C. Agr. Expt. Sta. of Clemson Agr. College, Clemson, S. C.

Continuous Pasteurizer Preheats With Vapor

Improvement is claimed in a patented method and device for pasteurizing liquid foods such as milk.

Invention relates to the method of pasteurizing whereby the liquid, which has been heated by steam, is allowed to expand at least once to an intermediate pressure, and the steam thus released is used to preheat the milk. Economy in the use of live steam and condensing water is a resulting advantage.

Equipment consists of a series of chambers, pipes, pumps, and vacuum apparatus through which the milk flows continuously. It is first sprayed into the preheating chamber, then pumped and sprayed into the pasteurizing chamber where live steam is introduced to raise the temperature to about 177 F. Pasteurized product is then sprayed into an expansion chamber where the temperature drops to about 123 F. Steam released during this expansion is transferred to the preheating chamber, which is under vacuum, where the original feed is preheated to about 112 F. Pasteurized product is transferred to a cooling chamber where its temperature is further reduced to 87 F. by expansion. —U. S. Patent 2,732,309, Jan. 24, 1956.

Versatile Lab Shaker

A low-cost shaker that will accommodate flasks ranging in size from 50 ml. to 4 l., has adjustable speed and stroke, operates quietly and with little maintenance has been developed at U. of Florida.

Protect your product purity with quality-controlled shipping

Now you can extend the results of your own exacting quality control measures right to your customer's door. Quality controlled shipping in USS Steel Drums is the answer.

HERE'S WHY:

Both the inside *and* outside of every drum-body, head and bottom are completely descaled. Following this, all surfaces are purged with an alkali solution that removes every single trace of processing dirt and grease. The final step is to completely cover all surfaces of the drum-body and both ends with a special phosphate solution that provides long-term protection from rust. These careful production steps add up to complete protection for your product — when your shipping is done in USS Steel Drums.

USS Steel Drums are available in sizes from 2½ to 110 gallons . . . plain or decorated. One of our many sizes and shapes of fittings is sure to meet your specifications.

"It's Better to Ship in Steel"

UNITED STATES STEEL PRODUCTS
DIVISION
UNITED STATES STEEL CORPORATION
DEPT. 656, 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Los Angeles and Alameda, Calif. • Port Arthur, Texas
Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

USS STEEL DRUMS

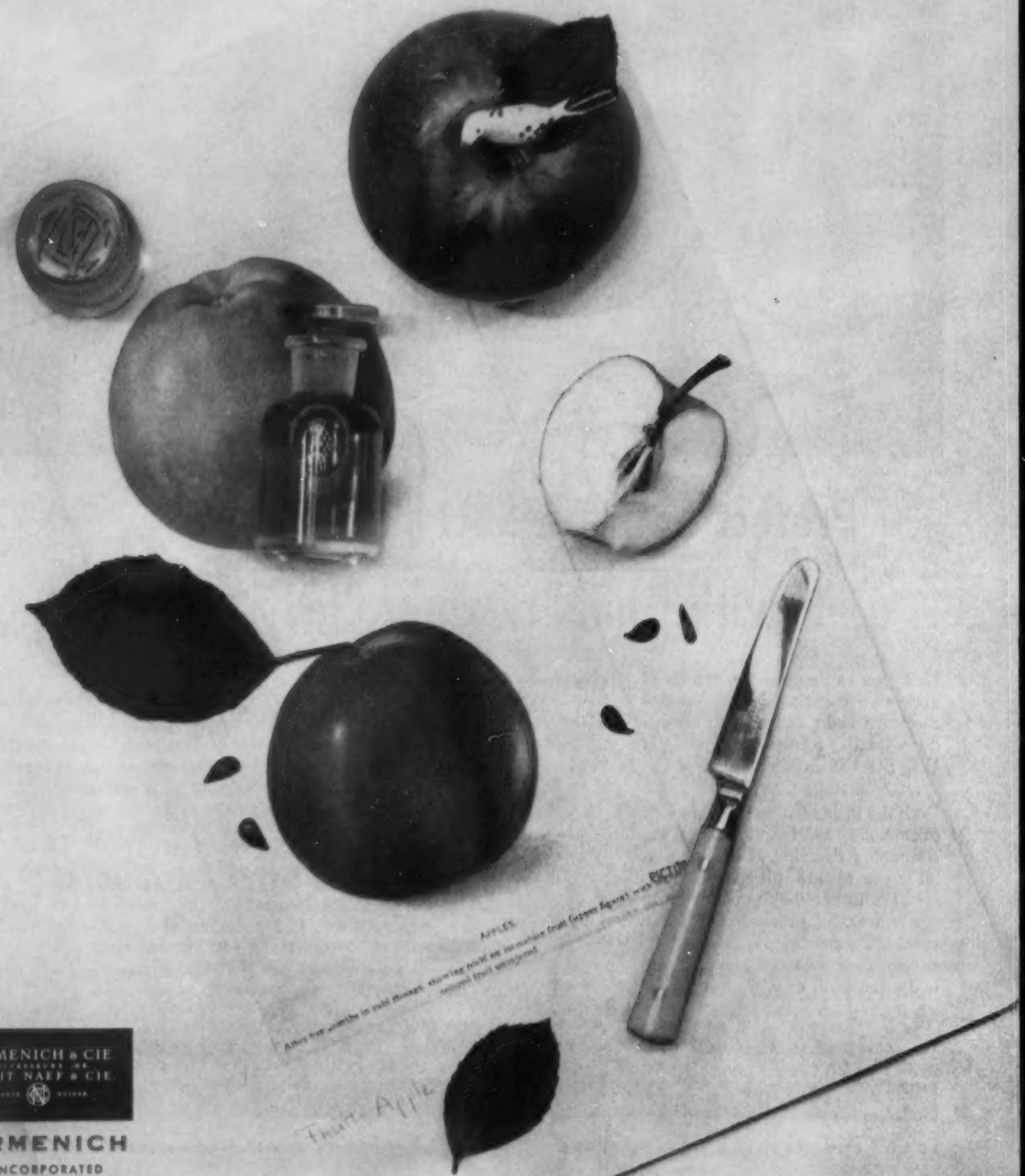
USS

UNITED STATES STEEL

For more data, circle this page number on card at back →

A for apple is the beginning of most primers. And apple is the first choice in flavor with most Americans, who enjoy an alphabet of apple dishes. To the distinguished family of Firmenich flavors, now enhancing many food products, is added that of Apple, captured by patient research and recreated by chemical skill. It is another Firmenich achievement, already welcomed by manufacturers who have added this popular flavor to their line of products; by others to improve those already established. Highly concentrated, stable, of the utmost fidelity and purity, Imitation Apple by Firmenich is offered with pride for your profitable use. Samples and technical data on request.

A FOR APPLE / NOW CAPTURED IN IMITATION APPLE BY FIRMENICH



FIRMENICH & CIE
SUCCESSEURS DE
CHUIT NAEF & CIE

FIRMENICH
INCORPORATED

250 WEST 18TH STREET, NEW YORK 11 • FIRMENICH OF CANADA, LIMITED, 548 WALLACE AVENUE, TORONTO • CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE • GENEVA • PARIS • LONDON

Shaker is powered by ¼ hp. 110v. AC ratio motor with output speed of 95.8 rpm. It is connected through a 4-step pulley to a crank with adjustable stroke which, in turn, is connected to the flask carrier. Carrier is connected with frame by 4 supporting rods that act to give it a gentle, short-arc, swinging motion.

Flask carrier has wooden base and sides. Its floor is lined with 1-in. foam rubber. Over this is laid a placement frame of ⅛ in. Masonite. This has hole patterns for different size flasks—sixty 125-ml., fifty-four 250-ml., twenty-eight 500-ml. or twenty-four 1,000-ml.

Flasks are secured in place by ½ in. plywood frames having holes slightly larger than flask necks, and aligned with holes in placement frames.

Amplitude of swing can be varied from 2½-4 in. by moving bolt in slot of throw plate. Speeds of 54, 80, 121, and 180 cycles/min. are obtained by the step pulleys.—*Leaflet Series No. 68*, Florida Engineering & Industrial Expt. Station, Gainesville, Fla.

Detergent Test for Milk Fat Is Accurate, Time Saving

An improved test for the fat content of dairy products that achieves greater accuracy than the original BDI test, and greater speed that the Babcock or Roese-Gottlieb methods has been developed.

Called the DPS detergent test, it employs 2 reagents: (1) Detergent reagent made by dissolving 7g. Na tetraphosphate, 2g. $NaHCO_3$, 3g. Triton X-100 (Rohm & Haas) or Tergitol Dispersant NPX (Carbide & Carbon Ch. Co.) and diluting to 100 ml. with distilled H_2O, and (2) methyl alcohol—ACS, 50% by volume.

Test bottles, pipettes, centrifuge, calipers, and tempering bath are similar to those used for the Babcock test.

Procedure for milk: Pipette 18g. milk (at 20 C.) to test bottle, add 5 ml. detergent reagent, shake to mix and transfer to boiling water bath for 2 min. Remove, shake to remix raised cream and replace in bath for 5 min. Repeat latter procedure twice more, then remove from bath without remixing and add 50% methy alcohol to bring contents to top of graduated scale.

Transfer bottle to unheated centrifuge and whirl 2 min., then place in water bath at 130-140 F. After about 5 min. remove from bath and with calipers or dividers measure fat column from lower surface to highest point of upper meniscus.

For cream, a 9g. sample is weighed

removes risk of contamination in food processing and canning

Juices, acids, alkalies, fats, oils . . . *all liquids* remain on the surface of solid woven Globe Kanry-Tex Belting. Neoprene latex impregnation of all fibres and voids *locks them out!*

Odors and flavors are not picked up nor imparted. Neoprene latex impregnation stands guard against them!

There you have two BIG reasons why fruits and vegetables conveyed with non-absorbent Kanry-Tex are not contaminated en route . . . why sorting and inspection are accomplished without adding "foreign" taste.

But there are other reasons — all just as important to food processing, canning and dehydrating plants — why Neoprene latex-impregnated Kanry-Tex is the most satisfactory of all belting. It may be washed and sterilized with hot water or live steam. Age won't deteriorate it — fibres are rot-free. There are no plies to separate. It's a solid woven carcass. It's tough, lasts longer, thereby reduces belting costs and downtime for change-over. Extremely flexible, it can be run over small pulleys. It permits slitting and trimming to narrower widths with clean-cut, unfrayed edges.

Write Dept. E for free, samples, literature and the name of your local distributor.

GLOBE

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK

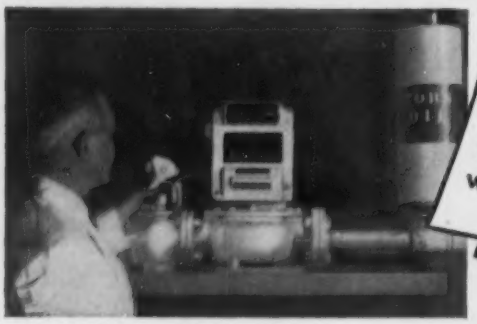
KNOWN FOR QUALITY THE WORLD OVER

For more data, circle this page number on card at back →

Neptune Meters Do Far More than Just Measure!

• THEY ARE MODERN PROCESSING INSTRUMENTS

• Here, for instance are a few ways you can save with Neptune:



By eliminating human errors in blending expensive ingredients, this meter paid for itself in one month!

Speed batch mixing by putting a standard Auto-Stop meter in each liquid ingredient line. Gives you *accurate* quantity control . . . *automatically.*

Small batches, from half a gallon to 20 gallons, are measured accurately with these two Neptune meters

Automatic control of pumps, valves, agitators, etc.: Simply rig Auto-Stop meters with electrical switches which are actuated when desired amount of liquid is delivered.

Eliminate losses due to rejected batches, spills and over-fills. Meters can't make "human" mistakes.

Eliminate unsanitary or hazardous conditions. Liquids stay inside the pipe all the way . . . no muss and fuss of gauge sticks, pails or batch tanks.

Insure full measure of liquid ingredient purchases

Save time, space, and labor costs by handling ingredients as liquids instead of dry solids. Many food plants find big savings in switch from granulated sugar to liquid sugar . . . with Neptune meters the key to accurate measurement.

Accurate inventory and cost control with less effort. All Neptune meters have totalizing counters to record consumption at every step in your process.

NEPTUNE METERS now handle more than 150 liquid chemicals and food ingredients. Sizes from 25 to 1000 gpm. Bronze construction. Excellent reputation for sustained accuracy and low maintenance. Telephone or write your nearest branch for full details. *Ask for Meter Data Book 566-QF.*

NEPTUNE METER COMPANY
19 West 50th Street, New York 20, N. Y.

Branches in:
ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER
NO. KANSAS CITY, MO. • LOS ANGELES • LOUISVILLE
PORTLAND, ORE. • SAN FRANCISCO

In Canada: NEPTUNE METERS LTD., TORONTO 14, ONTARIO

into cream test bottle, 10 ml. detergent reagent is added, then proceed as above. For 40-50% cream use 15 ml. of detergent. Measure fat column bottom to bottom, then subtract 0.75% to obtain correct fat content.

For ice cream, melt sample and mix until uniform, then weigh 9g. into ice cream test bottle and add 5 ml. detergent. Proceed as for milk. Measure fat column from bottom to bottom.

Fat values for milk and ice cream agree closely with those obtained with the Babcock and Roese-Gottlieb tests. On cream the uncorrected results average approximately 0.75% higher than Babcock and 1% higher than R-G results.—*Journal of the Assn. of Official Agr. Chemists*, 931-40, Nov. 1955.

Syrup Discoloration

Acidification of canning syrups to a pH of 5 or less will prevent discoloration resulting from prolonged holding at 180-190 F.

In an investigation to determine rate and extent of discoloration in canning syrups, made from corn, dextrose, and sucrose syrups, effects of pH and water composition were evaluated. Values for pH ranged from 3-9, water alkalinity from 0-253 ppm., hardness from 0-350 ppm.

Tendency for corn syrups to darken gradually increased as pH rose above 4, and at pH 9 all became decidedly discolored in 1 hr. Sucrose was stable up to pH 7, but darkened appreciably at pH 9.

Discoloration is slightly more pronounced in hard than in soft waters, and in the heavier syrups. But acidification will remedy the discoloration problem.—Talk entitled "Factors Affecting Sirup Discoloration," given at 49th Annual Convention, NCA, Atlantic City, Jan. 21, 1956.

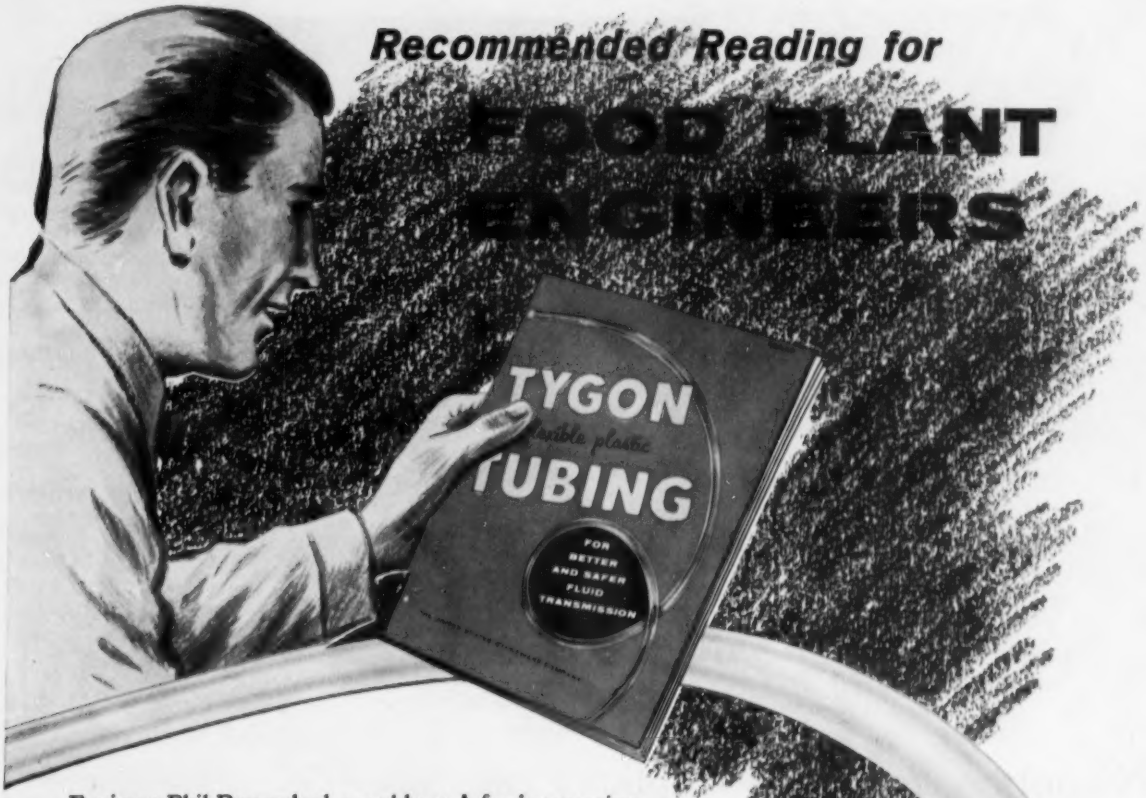
Quick Peroxide Test

In contrast to the customary time-consuming method for obtaining fat from milk and cream for peroxide tests, a short technique has been developed applicable to homogenized products.

Crux of the new method is use of a special de-emulsifying reagent.

Fat-peroxide values can be obtained in about 15 min. from as little as 30 ml. of milk and 3 ml. of cream. The de-emulsification reagent contains 50g. sodium citrate, 50g. sodium salicylate, and 86 ml. of n-butanol dissolved in 450 ml. distilled water.

Thirty ml. of milk and 15 ml. of



Engineer Phil Brown had a problem: A food processing operation in his plant was being expanded, necessitating rearrangement of existing units and installation of new equipment. New pipelines had to be provided to convey liquid and semi-solid foodstuffs—and time was at a premium! Down time had to be held to an absolute minimum, so the changeover would have to be made fast. But conventional piping installations take time . . .

So Phil dug out his copy of Tygon Tubing Bulletin T-87, and verified the fact that this versatile piping medium could solve many of his liquid food transmission problems—and solve them faster and more economically.

He found, for example, that Tygon Tubing can be installed quickly in long continuous runs without joints or couplings, and its extreme flexibility makes it adaptable to any layout. He learned that it is completely non-toxic—safe for even the most sensitive foods—and resistant to all food acids and alkalies. He liked its glass clear transparency which permits instant visual inspection of flow, and the fact that it can be disassembled and cleaned or steam sterilized in minutes.

Now Phil has the problem well in hand. At the moment he is referring to Bulletin T-87, selecting his requirements from the many types of Tygon Tubing (including vacuum and pressure types), and from the wide range of bore sizes—from 1/32" to 2" I.D.

Why not ask for *your* free copy of Bulletin T-87 today?

TYGON

PLASTIC TUBING

PLASTICS AND SYNTHETICS DIVISION

226-E

U. S. STONEWARE
AKRON 9, OHIO

For more data, circle this page number on card at back →

Nicholson *steam trap* simplicity *gives you*

peak performance, low-cost maintenance

Write, today, for your copy of new Bulletin 10-55—for detailed information.

Nicholson simplicity of design and operation pays off big in any plant . . . in peak performance for food processing . . . in easy, low-cost maintenance. Nicholson traps offer the most effective method for discharging condensate and air from steam lines.

- **one moving part—big husky bellows.**
- **positive shut-off—no waste of steam.**
- **high capacity—effective use of large orifice.**
- **each unit service tested—with steam.**

When less than the best won't do, specify Nicholson.

NICHOLSON

W. H. NICHOLSON and Company

TRAPS • VALVES • FLOATS • METAL PARTITIONS
LAUNDRY, DRY CLEANING AND PRESSING MACHINERY

14 OREGON STREET, WILKES-BARRE, PA. • SALES AND ENGINEERING OFFICES IN 98 PRINCIPAL CITIES

the de-emulsifying reagent are mixed, heated to 70 C. for 10 min. and centrifuged for 1 min. in a Babcock machine.

Fat is then brought into neck of the flask by addition of hot distilled water, and the flask is again centrifuged for 1 min. Thereafter it is immersed to the fat line in water at 45 C. for 5 min. to temper the fat which is removed with a pipette and measured out for use in the peroxide test.

Test follows method of Loftus Hills and Thiel (1946) except for the use of a photoelectric colorimeter instead of the visual type to measure the red ferric thiocyanate color. True weight of fat is determined by multiplying volume taken by 0.764, a correction found necessary to account for the solution of some of the butanol in the liberated fat.

The values for peroxide which are obtained by this method compare favorably with those obtained by the longer method of churning and oiling off.—*Australian Journal of Dairy Technology*, 72-75, April-June, 1955.

Beer Off-Flavors Inhibited By Antioxidant Solution

Development of off flavors and undesirable odors in aging malt beverages, particularly beer, can be prevented by addition of antioxidants in a manner revealed in recent patent specifications.

The antioxidant is selected from the group consisting of guaiaretic acid, nordihydroguaiaretic acid and its homologues, and is added in the form of a salt soluble in aqueous solution. This insures uniform distribution throughout the beverage.

Solution is prepared by dissolving the antioxidant in the form of the free acid in solution of a base that will yield a salt. This is prepared just before use, and has been found more effective if a small quantity of potassium metabisulfite, has been incorporated therein.

By way of example, 175g. of potassium metabisulfite is added to 6.5 l. of 3% Na OH solution. One pound of NDGA crystals is dissolved in this solution which is then mixed with 5 gal. of water and immediately added to 400 bbl. of beer having a density of 13 Balling.

The beer is circulated for 5 hr. to insure uniform distribution, and is carbonated during circulation. Concentration of antioxidant is 10 parts by weight NDGA to one million parts of beer. The natural acid derived from plants is preferred to the synthetic product.—U.S. Patent 2,732,306, Jan. 24, 1956.

Here's why so many packers like

Oakite General Cleaner

Enthusiastic reports keep coming in from food packers everywhere about the many uses of Oakite General Cleaner in plant-wide sanitation. Users are impressed with its powerful cleaning action, its water-softening ability and free-rinsing qualities . . . and delighted by its amazing economy. Here are a few typical comments.

CATSUP BOTTLER "We always had to scrape carbon from the copper coils in our 2300 gal. kettles. We don't scrape at all with Oakite General Cleaner. Tried it in our filler lines, too, and never saw them so clean."

VEGETABLE CANNER "Couldn't get grease off our bean canning lines without hurting the paint until we used Oakite General Cleaner."

DAIRY "Took your man at his word. Used 3 lbs. Oakite General Cleaner where we used to use 20 lbs. of another material. Worked fine."

MEAT PACKER "We clean aluminum sausage sticks in a rotary washer. Oakite General Cleaner is doing a perfect job . . . easy on the hands, too."

EGG PRODUCTS "That Oakite General Cleaner stuff sure goes to work on eggy smears . . . even softens up eggstone so it can be brushed off."

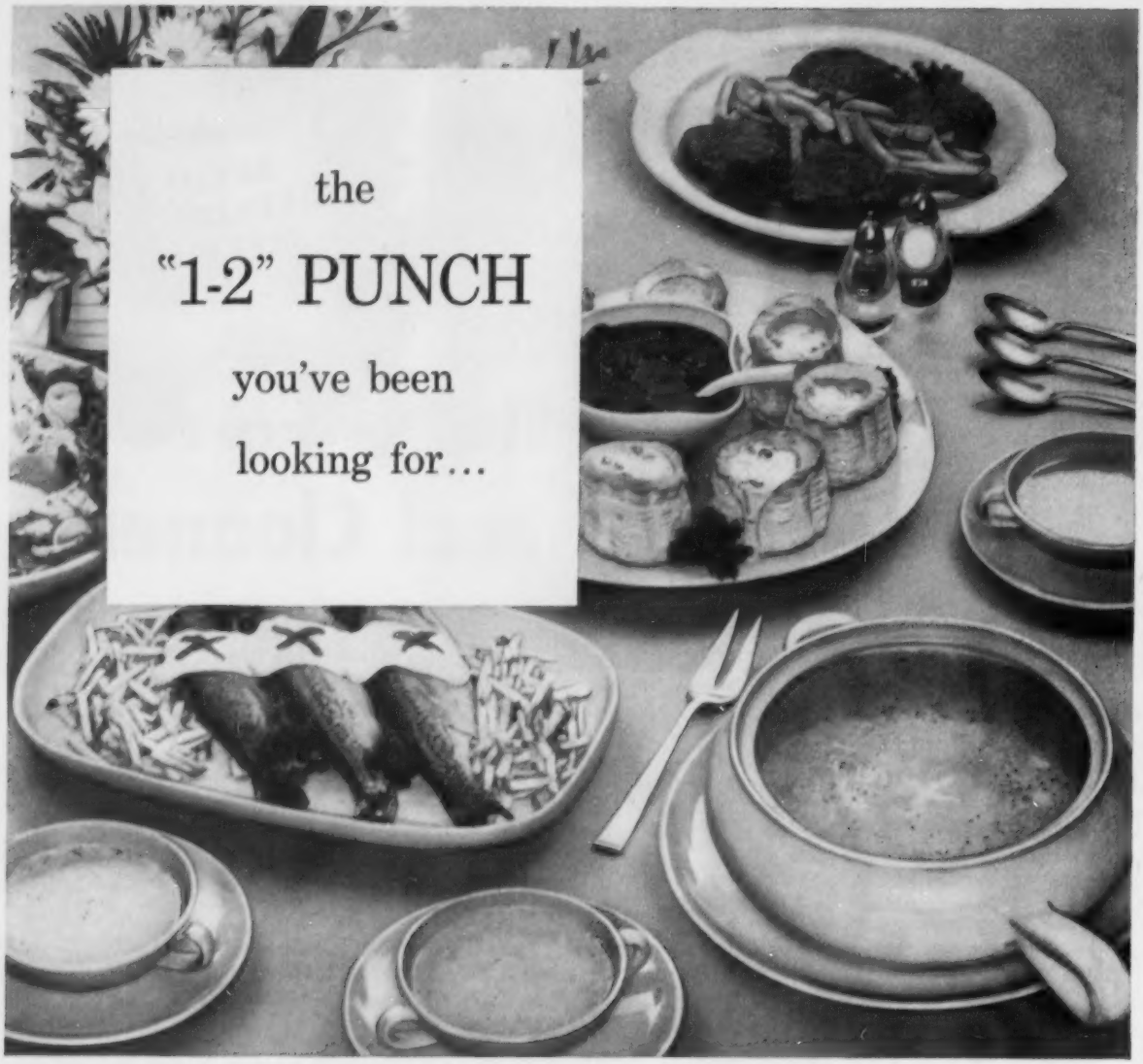
Oakite General Cleaner is making such a big hit with food packers because no industry puts more stress on fast, easy, economical sanitation. Ask your Oakite Technical Service Representative to demonstrate this versatile product in your plant. Or write to Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

Export Division
Cable Address: Oakite

OAKITE

Technical Service Representatives in Principal Cities of U. S. and Canada

For more data, circle this page number on card at back →



THE TASTE-MAKER

One is Huron MSG

PURE MONOSODIUM GLUTAMATE 99+%

to put that extra TASTE into your own fine flavors!

If you haven't as yet tasted the results of adding Huron MSG to *your* food product, you're in for a delightful surprise! Try it . . . and let your own taste buds tell you how flavors "come alive" with a new zip and zing that encourages passing the plate for more. (And *stocking up* on more next time Mom tours the super market!) Huron MSG adds *no* flavor of its own—simply coaxes and encourages the very best in the fine flavors you have to come shining through. For canned, frozen and other prepared foods—whether meat, fowl, fish or seafoods, vegetables, packaged dinners and other specialties—this versatile flavor intensifier can work wonders . . . in taste and in *sales!* Call in Huron, America's first producer of MSG . . . let our technical service people demonstrate, right in your plant, in your own products, MSG's effectiveness and economy. Write for a free sample today!

. . . And there is only one place to get both-

THE FLAVOR OF MEAT FROM WHEAT

...*the other is Huron* HVP

HYDROLYZED VEGETABLE PROTEINS

to ADD the savor of richly browned beef!

You *intensify* your flavors with Huron MSG; you *add* the hearty flavor of richly browned beef with Huron HVP, made from wholesome wheat protein. Used in small quantities, HVP adds a pleasing *background* of tasty meat flavor; used in larger quantities, Huron HVP will add a dominant, distinctly meaty flavor. Using Huron MSG and HVP *together*, food processors have discovered almost unlimited ways to *control* the flavor intensities of food specialties—from soups to sausage. They're building in EXTRA taste appeal, EXTRA brand preference, EXTRA sales! Only Huron offers you both MSG and a complete line of HVP in powdered, liquid and paste forms. For technical assistance right in your own plant . . . for quick, dependable service . . . call in America's pioneer in MSG and HVP. Call Huron. Write today for helpful information and free samples.

SEE US AT BOOTH 65, JEFFERSON HOTEL, DURING THE INSTITUTE OF FOOD TECHNOLOGISTS CONVENTION, ST. LOUIS, JUNE 10-13

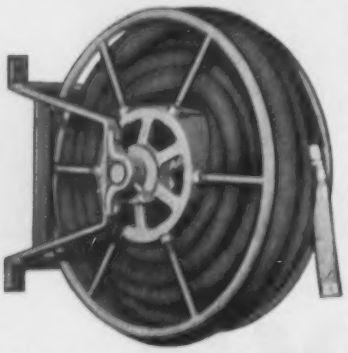
the HURON Milling Company

Executive Office: 3101 N. WOODWARD AVE., P. O. BOX 9, ROYAL OAK, MICHIGAN.
Sales Offices: 9 PARK PLACE, NEW YORK 7; 161 E. GRAND AVE., CHICAGO 11; 383 BRANNAN ST., SAN FRANCISCO 7; 607 SECOND NATIONAL BUILDING, CINCINNATI 2. ***Factory:*** HARBOR BEACH, MICHIGAN.

need a snake charmer?

not if you keep your hose on

WIRT & KNOX WASHREELS



Your costly wash up hose will last much longer if properly drained and coiled. The Washreel offers both these services and many more. To name a few . . .

√ Piped up permanently to your water line or mixing valves.
√ Eliminates handling of bulky coils of hose.
√ Keeps hose off the floor and out of the way of traffic.

Write us today for special details.

WIRT & KNOX
MANUFACTURING CO.
SEDGLEY AVE. at YORK ST.
PHILADELPHIA 32, PA.

Irradiation and Antibiotics

—Continued from page 57

corn starch, dextrins, simple sugars, proteins, flour, and corn, in the range of 3 to 20%; also to gaging fruit and vegetable tissues, starch suspensions, and milk, in the 50 to 95% range.

Noted as promising is the application of NMR for process control, since the measurement is essentially instantaneous and indicates moisture content in the form of an electrical signal, which can be used to automatically control dryers, blenders, or sorting equipment.

Recent work has indicated the feasibility of applying the method to continuous-flow measurement of moisture in whole grain (also see FE Apr., p. 56).

▶ NMR has not yet been applied to the meat industry, although there appear to be good possibilities for its use for the measurement of moisture, fat, and other hydrogen-containing constituents of meat.

Recent work has shown the possibility of measuring amino acids and other nitrogen-containing constituents by means of the nuclear magnetic resonance of nitrogen.

Augmenting Cake Volume With Rearranged Lard

Reasons for the superior behavior of molecular-modified lard were given by C. W. Hoerr, of Armour and Company.

Differences between lard and rearranged lard are magnified by the addition of flakes (highly hydrogenated triglycerides). Photomicrographic comparison of lard, rearranged lard, and hydrogenated vegetable oils containing various amounts of flakes, indicates a marked correlation between air distribution in plasticized fats (in respect to the manner in which these fats incorporate air in pound-cake batter) and volumes of baked cakes.

Dispersion Is Key

Irrespective of amount of air incorporated, greater cake volume appears to be directly proportional to degree of dispersion of air bubbles, both in plasticized fats and their respective batters.

Air was removed from several shortenings used for baking tests. Result was that rearranged lard and hydrogenated vegetable oils properly incorporated air in the batter and produced satisfactory cake volumes. But lard did not.

Tests with flaked liquid oils showed that high percentages of unsaturated triglycerides adversely affect baking performance.

▶ Superior baking characteristics of rearranged lard are attributable to the propitious occurrence of a proper assortment of intermediate-melting triglycerides which, in conjunction with flakes, produce a degree of air dispersion in batters conducive to high cake volumes.

Roundup on the Newest Product Improvers

Many additive materials have been proposed—and a number are now being used — in meat processing, pointed out G. D. Wilson, American Meat Institute Foundation.

Several of these increase moisture-holding capacity and reduce production costs. Others make for better color, flavor, texture, or improved stability.

Under federal regulation, sausage products may have 3½% of cereal binder or non-fat milk solids. Such materials are added on the basis of their cost, water-asborbing properties, and ability to retain moisture during processing.

Other compounds such as phosphates, gums, caseinate, and yeast are currently in experimental or commercial use. They are used in relatively low concentration, and their action may be dependent upon alteration of the normal characteristics of muscle tissue or absorption of extremely large quantities of moisture.

In addition to increasing moisture retention, some may also contribute to flavor, texture, or color.

Other additives, such as ascorbic acid, may aid the curing reaction, giving the sausage maker some assurance of optimum color for a product in minimum time.

In certain types of meats, MSG or hydrolyzed vegetable protein exert a very favorable effect on flavor.

Additional Benefits

Imitation smoke flavor and smoke distillates are being used experimentally and, in addition to adding flavor, have antioxidant properties.

In unsmoked sausage, certain synthetic antioxidants may be used to increase product stability.

As in the past, some of the various materials proposed won't "prove out." But the remainder, after a preliminary screening, must be carefully evaluated in the light of their effectiveness under varied conditions, cost, and freedom from harmful effects to the final product.

End (Resume reading on page 58)

More Brilliant than nature's own!

Helping food processors to add the tinge of color that improves upon Nature's own hues has been our business for over 50 years.

We offer a long line of Primary Colors and Blends, produced from basic raw materials wholly within our modern Buffalo plant. Each is standardized within remarkably close limits for uniformity of shade, pure-dye strength and composition. No higher standards of excellence can be consistently maintained.

For uniform color in your finished goods—regardless of season or climate or variations in your incoming foodstuffs-always specify National Certified Food Colors.

Write for your copy of the informative National Certified Color Catalog giving helpful information on blends for popular food-color shades, suggestions on the preparation and care of stock solutions for various food products and other useful data.

National CERTIFIED FOOD COLORS

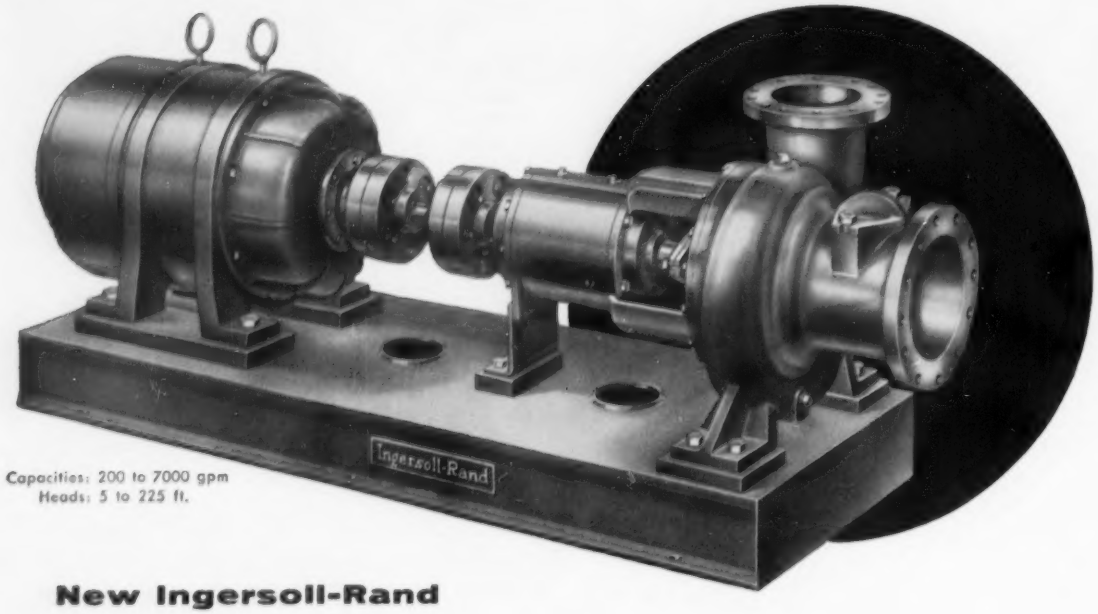
Allied Chemical

CERTIFIED COLOR DIVISION

NATIONAL ANILINE DIVISION ALLIED CHEMICAL & DYE CORPORATION • 40 RECTOR ST., NEW YORK 6, N. Y.

Boston Charlotte Chicago Philadelphia Portland, Ore. San Francisco Toronto

NO OTHER PUMP LIKE IT!



Capacities: 200 to 7000 gpm
Heads: 5 to 225 ft.

New Ingersoll-Rand

Industrial Liquids Pump

PREVENTS CLOGGING and VAPOR BINDING

even on the toughest jobs

. . . handles all ordinary liquids better, too!

HERE, for the first time, is a radically new type of centrifugal pump that is *non-clogging, non-vapor-binding, self-venting* and *self-regulating*. It's the Ingersoll-Rand Class EL, EM and EH Industrial Liquids Pump—especially designed for trouble-free handling of liquids containing solids, air or gases.

Unique patented design, with *diverging* impeller construction, enables the pump to handle foamy solutions containing up to 50% entrained air or gases, without danger of vapor binding. Viscous liquids or mixtures with exceptionally high solids content can be pumped with equal ease—with complete freedom from clogging. What's more, liquids containing crystals or other solids can be pumped without breakage or erosion of the suspended particles.

The I-R Industrial Liquids Pump can easily handle liquid conditions under which no other type of centrifugal pump would operate satisfactorily. Yet it can also be used to advantage for practically all ordinary pumping jobs, too. With *any type of liquid,* the pump will maintain its prime even when the suction piping is uncovered or exposed to the atmosphere!

For complete information on this revolutionary new pump design, send today for your free copy of Bulletin No. 7325.

Ingersoll-Rand

11 Broadway, New York 4, N.Y.

10-316

PUMPS • COMPRESSORS • VACUUM EQUIPMENT • GAS AND DIESEL ENGINES • AIR AND ELECTRIC TOOLS • ROCK DRILLS

Questions & Answers

MAY PROBLEM

Continuous Meat Process

Question—How can we continuously process table-ready items such as liver sausage, devilled hams, and similar meat spreads?

MARCH PROBLEM

Making Turkey "Logs"

Question was—Is any information available on the preparation of turkey rolls—an all-turkey meat item put up for the institutional trade? Product is somehow frozen into log-shaped rolls of about 10 lb. It needs only cutting into portion-size slices and then cooking. Can you also suggest percentages of white and dark meats?

Answer—Select "toms" in the 25 to 30-lb. range. Then, using a knife, make incisions along the breast bone, and peel off the skin in one piece. Pull large tendons from legs, trim dark meat from legs and thighs, strip white meat from breast, halve carcass, and cut away small pieces of meat.

You'll have to individually package and sell hearts, livers, necks, wings, and gizzards. Remaining carcass is cooked and additional small pieces of meat are removed for other turkey-food uses.

Dark and white meat, along with the single strip of skin, are scaled in 10-lb. lots into stainless-steel pans. Skin is now placed over the bottom of one-half of a round metal mold, with the excess overlapping the sides. Dark meat (40%) is hand-packed into the mold, and seasoning is sprinkled over it. Then, white meat (60%) is packed in, with additional seasoning.

Balance of skin is folded over the meat, and the top half of the mold is secured to form a round, log-shaped mold. Attach a metal rod about 1 in. above the top mold, then hammer two wooden, triangular-shaped door stops beneath the rod to firmly pack the meat and round it into shape.

Molds are finally loaded onto portable racks for freezing. Frozen logs are wrapped in aluminum foil or other suitable protective wrapper and packed into printed cartons.

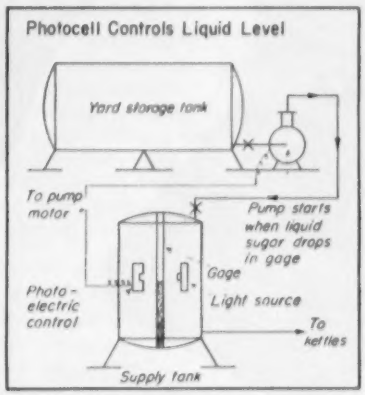
HOW TO DO IT?

Readers are invited to submit to Food ENGINEERING answers to question, "This Month's Problems." Selected answers will be published with credit (unless you specify otherwise). We pay space rates.

JUST ASK US

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.



Liquid-Level Control

Question—We've lost the old-time operator of our candy-cooking kettles, and our new man now points to something we've overlooked. Start-and-stop pushbuttons that operate the pump feeding liquid sugar are too far from the operator. Flow is from a bulk-storage tank on outside factory grounds to a plant supply tank near the cooking kettles.

Operator suggests that this supply tank should automatically be maintained at a certain level so that he doesn't have to keep his eyes on the tank's liquid-level gage, and then climb down from his work platform to start the pump. Have you a suggestion for setting up an automatic system to start the pump at predetermined level?

Answer—Put an "electric eye" to work. Such a photoelectric control could easily be installed (see diagram) by a competent electrician. Pump could be hooked up to a photo-electric control mounted on the liquid sugar-supply tank. When fluid in liquid-level gage drops below a pre-determined level, a beam of light from the light source strikes a photoelectric tube to start the pump.

use DOW CORNING Silicone Defoamers

The most versatile and efficient foam killers ever developed, they increase your productive capacity; reduce processing time; eliminate the waste and fire hazard of boil-overs.

In the **PROCESS INDUSTRIES**, including textiles, paper, rubber and specialty chemicals, foam is killed with Dow Corning Antifoam* A Emulsion, or with Dow Corning Antifoam A Compound as a solvent dispersion or mixed with an ingredient of the foamer.

In **FOOD PROCESSING** foam is controlled with Dow Corning Antifoam AF Emulsion, permissible at concentrations up to 34 ppm or, with Dow Corning Antifoam A at concentrations up to 10 ppm.

EFFECTIVE AT LOW CONCENTRATIONS

For example, you need only:
1 oz. Antifoam A Compound in 62,500 lbs. of 70% caustic liquor.
1 oz. Antifoam AF Emulsion in 2,075 lbs. chocolate syrup.

TEST THEM FREE!

Mail coupon today for sample

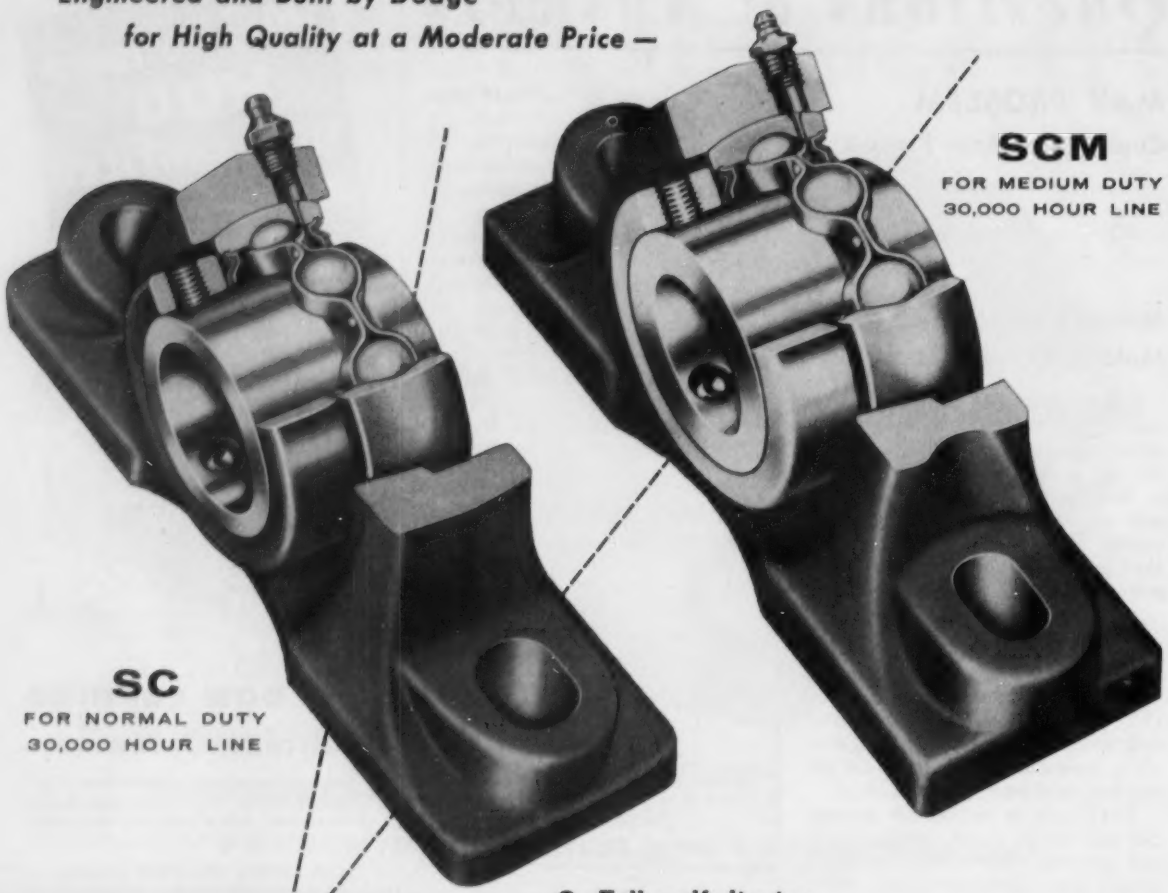
DOW CORNING SILICONES

Dow Corning Corporation
Midland, Mich., Dept. 5505
Please send me:
☐ Booklet on Silicone Defoamers; FREE sample of ☐ Antifoam A Compound ☐ Antifoam A or ☐ AF Emulsion;

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

* T.M. REG. U.S. PAT. OFF.

Engineered and Built by Dodge
for High Quality at a Moderate Price —



SCM
FOR MEDIUM DUTY
30,000 HOUR LINE

SC
FOR NORMAL DUTY
30,000 HOUR LINE

The Seal *Won't Blow!*

- Fully self-aligning.
- Rugged one-piece housing.
- Fully assembled and pre-lubricated at the factory.
- Sealed both on and off the shaft.
- Metallic backed synthetic rubber seals keep lubricant in, dust and dirt out. Engineered to stay put—*the seal won't blow!*
- Pillow block and flange cartridge types.
- Available from distributor stocks—SC in shaft sizes from 3/4" to 2-7/16"; SCM from 1-7/16" to 3-7/16".
- Write for bulletin complete with tabular data, engineering drawings, dimensions, weights, and radial load ratings.

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE MANUFACTURING CORPORATION
2800 Union Street, Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

More on Motor Failures

I'd like to offer some suggestions re your item (FE Jan., p. 178) on reducing unusually high motor failures due to daily hosing with high-pressure water.

Actually, the problem is complicated by many questions. As for type of enclosure, is it open? Drip-proof? Splash-proof? Totally-enclosed? And as for nature of the failures, are the bearings giving out? The electrical parts failing? Motors operated within their ratings? Or are they overloaded?

If motor enclosures are not suitable for hosing, refer to a special report reprinted from Oct. 1953 *Power*. It points out advantages and limitations of each type of motor enclosure.

Even with a splash-proof enclosure, mist may cause trouble.

If motors with adequate enclosures fail because of overload, rewinding with class "H" (high temperature) insulating materials may be an answer. Dow-Corning silicones are examples of such materials.

While Silco-Flex (a silicone elastomer, frequently referred to as silicone rubber) insulation is much more moisture resistant than those built up of silicone resins and other materials, I doubt that our engineers would consider it good practice to pressure-hose even this material.

Obviously, these are only stabs in the dark, since we do not have enough information to give a specific answer.

One other thought. Silco-Flex-insulated motors are available only in three-phase machines large enough to require form-wound coils.—*Robert S. Bloor, Advertising & Industrial Press Department, Allis-Chalmers Manufacturing Co., Milwaukee.*

Stuffing Turkeys

Question—Top management wants us to put up pre-stuffed frozen turkeys before the holiday seasons roll around. And, since I'm chief chemist, it's my task to work out some dressing formulas, stuff the birds, freeze them, and then evaluate quality of meat and dressings during storage tests.

Can you supply a basic formula for a good bread dressing as well as other types, like chestnut? And do you have any suggestions?

Answer—We know of only one type of dressing being used commercially. It's a bread type dressing. However, we'll suggest basic formulas for others, but you'll have to check them for shelf-life, off-odors, off-flavors, etc.

The bread dressing—Saute in a kettle, containing 10 lb. of margarine, 10 lb. of finely chopped onions and 10 lb. of finely chopped celery (leaves and stalk).

Blend into batch 52 lb. of diced bread (several days old), 5 oz. of salt, ¾ oz. of ground pepper, and 2½ oz. of poultry seasoning. Moisten with 40 lb. of turkey broth until well mixed.

Stuff into dressed, eviscerated turkeys, and freeze.

Preparation of other dressings calls for modifying the basic bread-type formula through addition of other ingredients. For example:

Chestnut dressing—Add 6 lb. of cooked, chopped chestnuts.

Giblet dressing—Add 20-25 lb. of cooked, chopped giblets.

Oyster dressing—Add 15 lb. of chopped raw oyster, and try substituting part of the oyster liquor for turkey broth.

Mushroom dressing—Saute 6 lb. of sliced mushrooms in margarine, along with onions and celery, in preparation of the bread dressing.

Sausage dressing—We'd be rather skeptical about putting this dressing into frozen stuffed turkeys because of the short shelf-life (2 to 3 months) of frozen sausage. If you'd like to try it, start by making the bread dressing, then brown about 20 lb. of sausage meat along with onions and celery—but omit the margarine (10 lb.) suggested for sauteing onions and celery.

Big problem facing packers of pre-stuffed turkeys is producing a tender bird, according to findings reported by G. F. Stewart, Univ. of Calif. Trouble with most packers is that turkeys are stuffed and frozen immediately after eviscerating. This means the housewife must allow a day's thawing time for tenderizing.

Stewart suggests pre-aging in the packers' plant by aging ice-packed eviscerated birds overnight.

Q.—To label our ice cream "Dietetic", what should the caloric content run?

A.—Between 140 and 190 calories per 100 g., depending upon butterfat content and sugar substitute.

Papaya-Banana Nectar

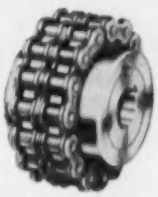
Question—How would you can a nectar blend of papaya and banana?

Answer—Here's a pleasant, aromatic, and delicious blend containing the dark banana seeds. They may be removed, if desired, by pulping bananas through an 0.027 or 0.028-in. screen.

Nectar stock consists of papaya

DODGE PRODUCTS you should know

AIR-GRIP CLUTCHES



CHAIN COUPLINGS

SEALED-LIFE V-BELTS

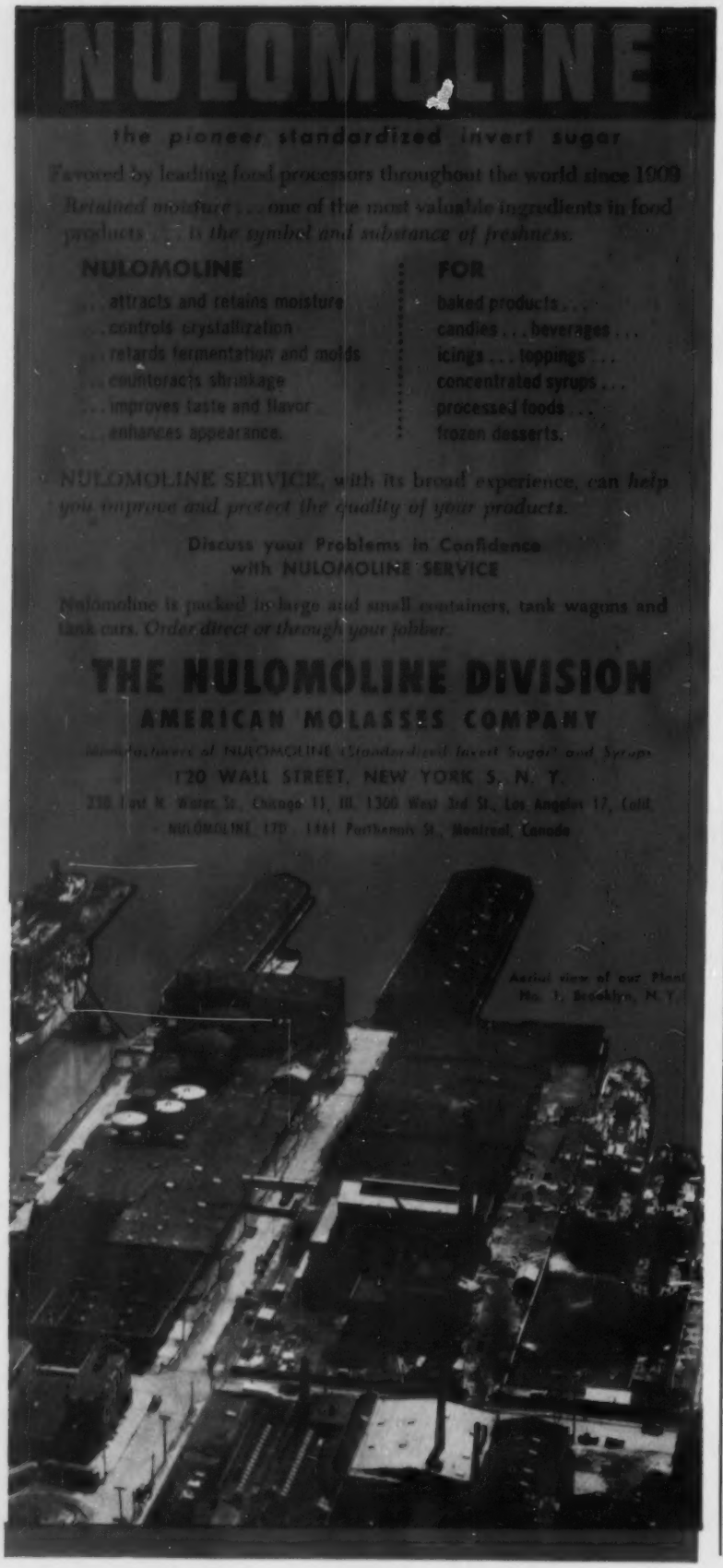
DODGE BULLETINS YOU SHOULD HAVE

- Air-Grip Clutches. Technical data, sizes and selection tables. Bulletin A634.
- Chain Couplings, Taper-Lock Sprockets and Dodge Roller Chains. Technical data and selection methods. Bulletin A644
- Sealed-Life V-Belts. Construction details and complete data on sizes, pitch lengths and outside lengths. Bulletin A606

Write for your copies.

DODGE MANUFACTURING CORPORATION
2800 Union Street • Mishawaka, Indiana

DODGE
of Mishawaka, Ind.


NULOMOLINE
the pioneer standardized invert sugar
Favored by leading food processors throughout the world since 1909
Retained moisture . . . one of the most valuable ingredients in food products . . . is the symbol and substance of freshness.
NULOMOLINE
. . . attracts and retains moisture
. . . controls crystallization
. . . retards fermentation and molds
. . . counteracts shrinkage
. . . improves taste and flavor
. . . enhances appearance.
FOR
baked products . . .
candies . . . beverages . . .
icings . . . toppings . . .
concentrated syrups . . .
processed foods . . .
frozen desserts.
NULOMOLINE SERVICE, with its broad experience, can help you improve and protect the quality of your products.
Discuss your Problems in Confidence with NULOMOLINE SERVICE
Nulomoline is packed in large and small containers, tank wagons and tank cars. Order direct or through your jobber.
THE NULOMOLINE DIVISION
AMERICAN MOLASSES COMPANY
Manufacturers of NULOMOLINE Standardized Invert Sugar and Syrups
120 WALL STREET, NEW YORK 5, N. Y.
NULOMOLINE LTD. 1461 Panthenais St., Montreal, Canada
Aerial view of our Plant No. 1, Brooklyn, N. Y.

puree and pureed banana (fully ripe and free of blemishes). Following formula, which employs 35% stock puree, is made to cut out at 11% soluble solids with a pH of 4.0:

Papaya puree, 95.0 lb. (12% soluble solids summer fruit); banana puree, 5.0 lb.; sugar, 18.5 lb.; citric acid, 0.5 lb.; and water, 167.0 lb.

Run into stainless-steel tank $\frac{7}{8}$ of required water. Then add, with agitation, sugar, blended pulp, and citric acid dissolved in balance of water.

Flash-pasteurize batch at 205 F. or heat to 195 F. in steam-jacketed kettle. Fill into cans and water-cool.—*Progress Notes* 81, *Hawaii Agricultural Experiment Station, U. of Hawaii, Honolulu, T. H.*

Mixing Affects Sausage

Question—In our sausage-meat operations, we are confronted with certain quality variations that, we believe, must be due to differences in mixing. We have tried to tighten up supervision of the mixing operation and have noted some improvement. Is there anything we can do to the mixers to insure uniform action from batch to batch?

Answer—We must start with the premise that your present mixers are capable of making a satisfactory product, at least under proper conditions. Your trouble seems to be in reproducing proper mixing action, so that product from each batch meets your quality standards. This suggests that your difficulties do not lie in the design and construction of the equipment itself. If they did, you would not expect to get proper mixing at any time.

Thus, it appears that the source of your trouble is the manner in which the mixers are operated. Most promising angle of attack is to find out what variables exist in the mixing operation from batch to batch. Then, they must be brought under the degree of control necessary to insure uniform quality in every mix.

One very successful technique for analyzing mixer operations is to install a recording mixture-consistency meter. An ingenious form of this instrument makes use of what is known as a "thermal converter". When connected to the mixer motor power line through a transformer, it produces a voltage signal proportional to the power consumed. If you have only a few mixers, you might be able to rent such an instrument. However, you probably would find it sufficient valuable to purchase one.

First, connect the unit to one mixer motor, and record power consumption

vs. time for a series of batches. Then study the record for any variations from batch to batch.

You may be surprised at the amount of information. It includes data such as exact mixing time, maximum power consumption, whether power builds up steadily to this maximum, how long it takes to reach the maximum, and how long the mixer operates after reaching maximum power. Very often, such a record even shows the point at which various ingredients are added, since these additions may change the power drawn by the mixer motor.

The meter can be successively installed on each mixer so that performance of machines (and possibly operators) can be compared.

It seems likely that your records will show some batches being mixed longer than others, or ingredients being added in a different manner. In some machines overmixing is actually harmful in that it may promote separation or segregation of ingredients.

Final step, after analyzing the records, is to pick the optimum mixer performance and then set up as foolproof a method as practical to consistently duplicate it. One help might be an automatic timer on the mixer, or even an automatic cycle controller to govern the addition of ingredients according to a set plan.

If you can explain the function and value of the recording instrument to the operator, it may prove desirable to arrange for a permanent installation. With the record to guide him, an operator might find it possible to handle more mixers and still produce a more uniform product.

Q.—What will prevent formation of brown streaks through the top crust of our baked pies?

A.—Make certain that such caramelizing or browning ingredients as sugar and milk solids are thoroughly dissolved, and that the pastry dough is well mixed.

Asparagus Soup Formula

Question—We'd appreciate a formula for a condensed cream of asparagus soup to be packed in cans.

Answer—Here are directions for making a basic condensed cream of asparagus soup that you can modify to suit your requirements:

Boil in a steam-jacketed kettle 50 gal. of milk. In separate small kettle melt 18¾ lb. of butter and mix with 15 lb. of flour. Add butter-flour

CUT COOLING TIME

RAISE PROCESS QUALITY

with

C. H. WHEELER VACUUM REFRIGERATION

Employing the principle of flash evaporation, here's what C. H. Wheeler Steam Jet Vacuum Refrigeration will give you in food processing:

Low initial cost of equipment in standard assemblies consisting of steam jet ejectors, boosters, barometric or surface condensers and water pumps • Low installation cost • Low cost operation using plant steam at pressures down to 2 psi • Savings in space in plant, on roof or outdoors • Savings on maintenance, because there are no moving parts in a steam jet vacuum system except the chilled water pump • Uniform production capacity, because there is no wear or scale formation • Easy operation with either manual or automatic instrument control • Overload capacity without damage • Economical operation at part load • Maximum safety, no noxious gases, no pressure or explosion hazard • No noise or vibration • Cooling to any temperature above 35° F.

TYPICAL ADVANTAGES OF C. H. WHEELER STEAM JET VACUUM REFRIGERATION IN SPECIFIC APPLICATIONS:

LEAFY VEGETABLES

Savings on packaging, shipping and labor.

MEATS

Faster cooling penetrates centers, raises quality, reduces spoilage.

PROCESS-WATER

Recycling conserves water for various plant cooling requirements.

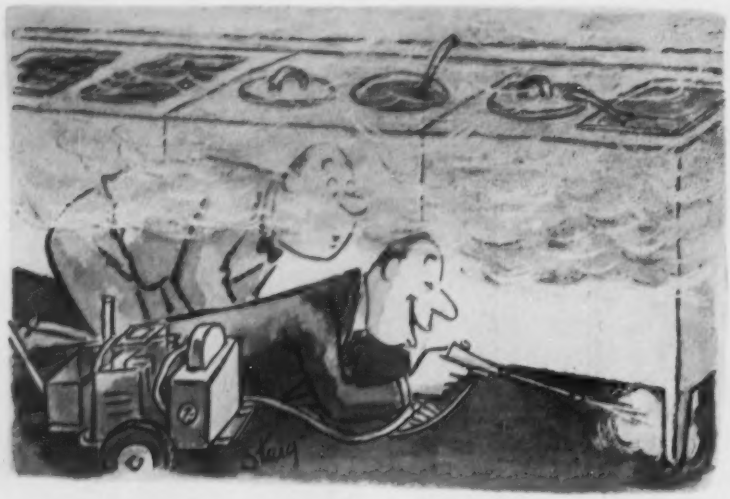
Investigate the possibilities in your plant for C. H. Wheeler Steam Jet Vacuum Refrigeration. Write for Bulletin 1462 and name of nearest representative.

WE.606

C.H. Wheeler

C. H. WHEELER MANUFACTURING CO., 19th & Lehigh, Phila. 32, Pa.

Steam Jet Ejectors • Vacuum Refrigeration • High Vacuum Process Equipment • Steam Condensers
Centrifugal, Axial and Mixed Flow Pumps • Deck Machinery • Marine Condensers, Ejectors and Pumps



"Insects can't escape SUPER MIST-O-RIZER's *fog or spray!"*

No remote crack or crevice is inaccessible.

WEST's portable SUPER MIST-O-RIZER goes everywhere! It either fogs or sprays VAPOSECTOR, WEST's highly concentrated insecticide. Coverage is amazing.

In fogging, one three gallon filling with VAPOSECTOR controls:
– flying insects in 400,000 cu. ft. of space.
– crawling insects in 200,000 cu. ft. of space.

NO waste! WEST's SUPER MIST-O-RIZER atomizes VAPOSECTOR into uniform 8 micron-sized particles. Creates a "dry mist" that doesn't wet or condense on surfaces.

And in contact spraying, 12 feet of air hose attached to the hand sprayer provide easy access to hard-to-reach areas.

LET a WEST Specialist demonstrate the insect killing power of SUPER MIST-O-RIZER and VAPOSECTOR which is safe to use as directed around foodstuffs. Or ask about our complete program of insect control, including everything from tailormade permanent installations to small hand operated units. Just write, or call your local WEST office.

OLDEST AND LARGEST COMPANY OF ITS KIND IN THE WORLD

75th WEST DISINFECTING Company ANNIVERSARY

FREE BOOKLET

Use your business letterhead to request our 32-page booklet, "Industrial Insect Control."

WEST DISINFECTING COMPANY
Dept. B, 42-16 West St.
Long Island City 1, N. Y.

Branches in Principal Cities • In Canada: 5621-23 Casgrain Avenue, Montreal

mix to milk, and heat until batch thickens.

Now introduce 50 gal. of asparagus pulp, 50 gal. of vegetable stock, 10 lb. of salt, and 2½ lb. of ground white pepper. Bring batch to boil, fill into cans, seal, and heat-process in retorts.

Frozen Vichysoisse

Question—How can we prepare vichysoisse to be packaged in suitable consumer-size containers and then frozen?

Answer—Add to jacketed kettle:

Potatoes (sliced), 100 lb.; onions (sliced), 15 lb.; leeks (sliced), 10 lb.; water, 12½ gal.; granulated chicken bouillon cubes, 2½ lb.; white pepper, 5 oz.; and celery salt, 1¾ oz.

Slowly cook until vegetables are done, then run batch through pulper or paddle-type finisher. Next, mix 5 gal. of light cream into the pulp.

Fill into cans, paper containers with metal ends, or liquid-holding paper containers, and then freeze.

Trouble at Shipping Dock

Question—Have you any good solution to the problem of variance between elevation of shipping dock and various trucks—empty and loaded? Frequently, we push hand trucks loaded with merchandise up quite an incline to get them into outbound trucks, which is a serious accident hazard. Still, we cannot operate our fork-lifts in highway trucks because of weight or mast limitations.

Answer—Use of adjustable sections of shipping dock has been advocated. These may be power lifted and operated from the dock so that any unloading spot can be adjusted to truck-bed height. While this would not eliminate the incline, it would provide a stable loading ramp into the truck.

Possibly more effective, but inherently more expensive, are adjustable pits into which the rear wheels of highway trucks can be backed. Naturally size, strength, and power requirements must be correspondingly greater in order to lift or lower a truck to conform with dock elevation. But such an adjustment would provide a level entrance to the truck for loading and eliminate a source of accidents to personnel.

Finally, you might consider a very low-cost approach that has been successful in some instances and might also meet your requirements. Bring your merchandise to the truck on pal-

lets with fork-lifts, and use these pallets to set loads into highway trucks regardless of difference in elevation.

Key to this system are pallet dollies, little more than roller platforms of approximately pallet size. A dolly is set at the rear edge of the truck (can be positioned manually or by fork truck), and the load is then set on the dolly to make it easily maneuverable in the highway truck.

Effort required to push these loads is not excessive, and investment in dollies is quite nominal. We believe it would be worth trying.

Preparing Chop Suey

Question—Please let us have information on how to manufacture frozen vegetable chop suey for the retail trade.

Answer—In a kettle, lightly brown 37½ lb. of sliced onions in 6 lb. of lard. Introduce 24 lb. of celery (¼-in. pieces) and 4½ gal. of water, and simmer ½ hr. Add 4½ lb. of meat concentrate (Armour's Vitalox or Wilson's B-V) dissolved in a little water.

Now add 6 lb. of sliced mushrooms, 6 lb. of sliced green pepper, and 18 lb. of bean sprouts. Bring to boil, and thicken with paste consisting of 2 lb. of cornstarch and 1½ qt. of cold water. Fill into suitable containers, and freeze.

Vegetable Knives Break

Question—We are considering a new dicer for pickles and vegetables, but are concerned with possible breakage of the thin metal knives. Reason is that occasionally foreign matter such as a stone or wood splinter may be present. Have you any suggestions on how to guard against knife breakage, so that we can take advantage of the better cutting action and improved product appearance obtainable with the proposed dicer? We do not want to go to the expense of hand sorting raw materials.

Answer—Set up a suitable water tank ahead of the dicer to separate foreign matter by difference in specific gravity—somewhat along the lines used in the metallurgical industry. Idea would be to dump the raw material (which, we assume, would be in barrels or some sort of tote boxes) into water, so that possible stones or other heavy materials would sink to the bottom. These would be retained in a pocket or trap constructed for the purpose.

Vegetables would be lifted out of the water by a suitable conveyor belt

Very Few
CONVEYING PROBLEMS
are New to Us...

A typical system of Mathews gravity and power conveyers and special conveying machinery, designed to create a continuous flow of material in modern manufacturing plants in the United States and Canada.

Every day some manufacturer runs head-on into a conveying problem that's new to him . . . a handling job that he hasn't had to do before. It may be a package of unusual size or shape, or there may be unusual characteristics regarding space, temperature or weight.

Whatever the problem might be, chances are, we've done something like it, somewhere, sometime before.

That's where experience pays off, and you get the benefit of fifty years of it when you buy Mathews Conveyers.

50 YEARS OF MC MECHANIZED HANDLING

MATHEWS CONVEYER COMPANY

GENERAL OFFICES . . . ELLWOOD CITY, PENNSYLVANIA
PACIFIC COAST DIV., MATHEWS CONVEYER COMPANY WEST COAST, SAN CARLOS, CALIFORNIA
CANADIAN DIVISION . . . MATHEWS CONVEYER COMPANY, LTD. PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities.
Export Representative—Foreign Trade Division of New York Hanseatic Corp.

MATHEWS

With this new, sectional design Niagara condenser you avoid the many troubles due to faulty condensing and get at all times the full capacity your refrigerating plant should afford.

You benefit from extra saving in upkeep labor and expense. The casing of this new condenser is made of sections each separately removable, giving you access to all parts for easy inspection to head off dirt and corrosion, to clean the coils easily from either side.

You benefit from greater efficiency in condensing. A simpler method of using evaporative cooling improves heat transfer. You benefit from Niagara features that remove super-heat before condensing and keep the system purged of oil. You save 95% of the cooling water cost.

You benefit from a low first cost, lower freight cost and less expense in erection.

Capacity range is from 90 to 240 tons. Write for Niagara Bulletin 131. Find out how your plant can save expense this season.

NIAGARA BLOWER COMPANY

Dept. F.I., 405 Lexington Ave.
New York 17, N. Y.

District Engineers in Principal Cities.

NIAGARA — *Over 40 Years' Service in Industrial Air Engineering*

and delivered to the feed chute or hopper leading to the dicer. A wire-mesh belt (with cleats) could be used to lift the vegetables out of the separating tank at an angle and provide drainage.

Whether or not this treatment completely removes stray wood splinters depends upon the specific gravity of the vegetables. Pickles, of course, are heavier than wood. As latter floats to the surface, it could be observed and removed. For floating vegetables, however, supplementary treatment might be required.

A possible method of wood removal is to direct a high-pressure water spray against the inclined draining conveyor from the under side. This tends to wash any splinters to the surface and carry them downward against the flow of vegetables and into the dump tank.

One further precaution: Put a non-metallic section on the discharge side of the dicer, and install an inexpensive metal-detector there to monitor the diced product flow. Then, if a knife should be broken in spite of the preliminary separating treatment, a signal would immediately operate and the process could be shut down for correction.

In case the knife blades are steel, a magnetic trap on the diced product discharge would be valuable. However, most stainless steels are not sufficiently magnetic to be caught.

Q.—What is the procedure for manufacturing tabasco sauce?

A.—Cook tabasco peppers until thoroughly disintegrated, and then run through a sieve to remove seeds, etc. Cook 25 gal. of tabasco pulp, along with 5 lb. of salt to 21¼ gal. Then add 5 gal. of 100-grain vinegar, and cook an additional 5 min. Finally, fill 190-F. sauce into bottles, and pasteurize.

Ham-Like Soup Base

Question—Can you furnish us with a formula for a ham-like soup base?

Answer—Here's a basic formula you might try:

Yeast-base bouillon powder, 24.5 lb.; salt, 38.0 lb.; sucrose, 21.0 lb.; dehydrated onion powder, 2.5 lb.; smoked yeast, 6.25 lb.; monosodium glutamate, 1.5 lb.; dextrose, 6.0 lb.; and smoke flavor, 0.35 lb.

Mix 85 parts of above with 15 parts of vegetable oil. Use 1 oz. to 1 qt. of water.—*Roy E. Morse, Professor of Food Technology, Rutgers University, New Brunswick, N. J.*

Cooling Fish Sticks

—Continued from page 61

sweep arm gently transfers the sticks from infeed conveyor to a "dump" conveyor that feeds them into spaced, stainless-steel mesh baskets. These are suspended from chains that move vertically in advancing toward the unit's discharge end.

After 15 min. of travel, sticks are cooled to 60-75 F. Then the same baskets level off to form a conveyor-packoff table as they return to the starting point in the cooler.

Incorporated into the line is an automatic carton former (Kliklok), which supplies boxes to a belt running above and parallel to the packoff table. This arrangement permits considerable space saving and efficient handling.

Sticks are packed in two layers of five, then the carton is automatically closed, coded, and wrapped. Finally, packages are tray-fed into plate freezers, cased automatically, and stored at zero F.

The cooler measures about 48 ft. long, 5 ft. wide, and 8½ ft. high. Its stainless and structural-steel frames are electrically welded, while the finish is of white enamel.

The drive mechanism has a safety throw-off switch that stops the machine in case of overloading. And this switch is adjustable with individual work loads. Drive motor is ½ hp., 60 cycles, 3 phase. A 5-hp. fan motor is wired for 220v.

Cooling is by refrigerated air supplied by a Freon-12 system that uses two 15-hp. compressors—one for each line. Air velocity in the cooler is low enough to avoid dislodging of the sticks, yet sufficiently high for efficient heat transfer. Air temperature stabilizes at about 40 F. after the initial heat load on the cooler is removed.

Sticks are laboratory controlled in every stage of their processing. Initially, bacteriological and organoleptic tests are run on all incoming fish and breading materials. Then, samples are regularly taken at various points along the line. These are checked for bacteria count, taste, appearance, and weight.

In addition, operators checkweigh the sticks at several points.

But sanitation is the basis of quality control at Teddy's and it receives the special attention of a night cleaning crew. All batter feed lines and pumps are cleaned every night. The fryer is drained through a filter, then treated with a solvent-type sanitizer and wiped dry. All conveyors are scrubbed as are the baskets in the cooler. And the cooler's residue collectors are cleaned out.

End (Resume reading on page 62)

meat processors:
Order Cuts or Moulds to YOUR Specifications!
BONED TO YOUR SPECIFICATIONS!
MOULDED TO YOUR SPECIFICATIONS!
Rosenthal Packing Company

WE'LL SHIP IN ANY QUANTITY!

Now meat processors can order cuts to their own specifications — fresh or frozen. Our refrigerated trucks deliver your special order to your plant ready for further processing and packaging — just as specified. You have no trimmings to dispose of . . . no waste . . . you save capital investment . . . you save time and increase production. Sell all the meat you buy. All this extra special service, plus the controlled quality you specifically order, adds up to savings for you. All meats U. S. Government inspected.

GET IN TOUCH NOW
USE THIS COUPON OR PHONE COLLECT
MArket 6-2803

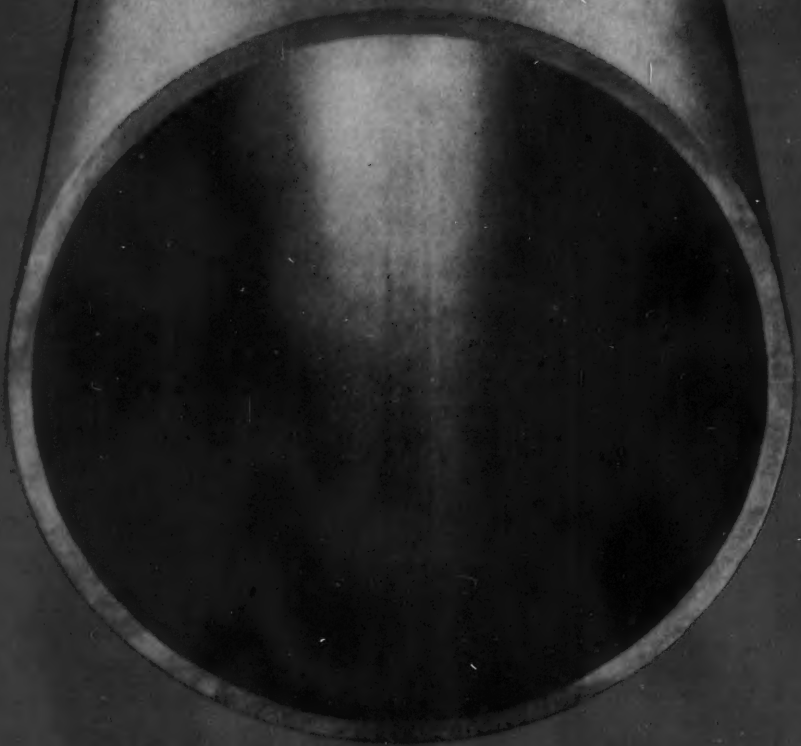
ROSENTHAL Packing Company
SLAUGHTERERS AND PROCESSORS OF
BEEF • VEAL • PORK • MUTTON • LAMB
FORT WORTH, TEXAS

Address Inquiries to:
Special Order Division
Rosenthal Packing Company
P. O. Box 8
Fort Worth, Texas
Telephone: MArket 6-2803

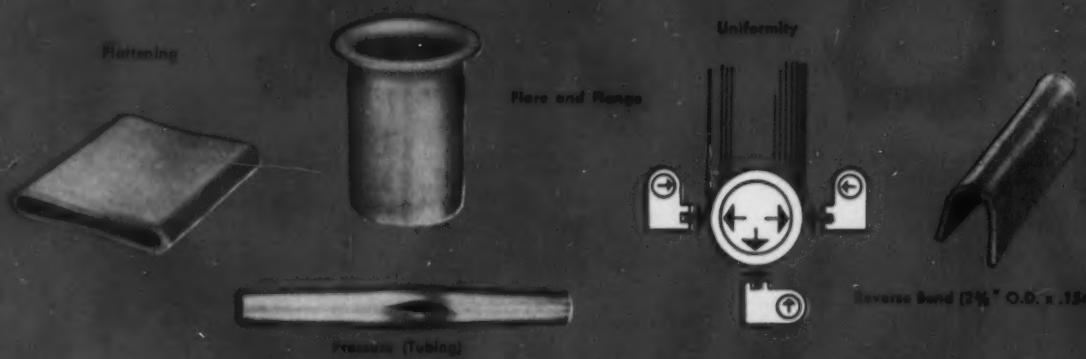
NAME OF PLANT_____
ADDRESS_____
CITY_____ STATE_____
NAME OF INQUIRER_____

For more data, circle this page number on card at back →

it's smoother,



CONTOUR-WELD PIPE...BEST BY ANY TEST YOU CAN NAME



stronger

...new Contour-Welded Stainless pipe completely free of bead or undercut

You can't even *feel* the weld on new TRENTWELD stainless pipe and tubing, thanks to the new, exclusive *Contour-Welding** process.

Here's How It Works *Contour-Welding*, shown in detail below, is an entirely new and patented process of making welded pipe and tubing. It results in a weld that conforms to the exact contour of the pipe. And the weld is so smooth you can't even feel it. There's never a hint of weld-bead or undercut, where corrosion or erosion can get started.

New TRENTWELD Is Better Than Ever Now you get all of the proved-best features of TRENTWELD – uniform stainless strip...wall thickness that never varies throughout the pipe or tube... curvature that's always 'in-round' – *plus* new *Contour-Welding* which extends this uniformity to the weld zone itself. What's more, Trent's superior cold-working facilities mean an even stronger pipe with smoother flared or flanged ends. Result: New TRENTWELD outperforms any other pipe, welded or not.

Put *Contour-Welded* pipe or tubing through any test you like. But the best test is your next job, especially if it's a tough one like a high-pressure hydraulic system...a line carrying corrosive chemicals . . . or high-velocity system. New TRENTWELD comes in any size or gage... and in most grades, including Hastelloy, Zirconium, Zircoloy, Titanium and 19-9-DL. You can use it with confidence – it's a product of Trent, tube mill *specialists*.

*Contour-Weld is the trade mark of the Trent Tube Company for its process of welding pipe and tubing which is protected under U.S. Patent 2,716,692.

Why Trent's Exclusive *Contour-Weld* Process Means Smoother Welds...

Normally, in producing welded pipe, the weld is made at the top. But gravity plays a nasty trick. It tugs at the fluid metal in the weld zone, pulling it down toward the middle of the pipe. The result, particularly in the heavier gages, is a perceptible bulge where it hurts the most – right on the I.D. surface. If you try to get rid of the bulge – at fair cost – the metal is undercut – and corrosion and erosion start there.

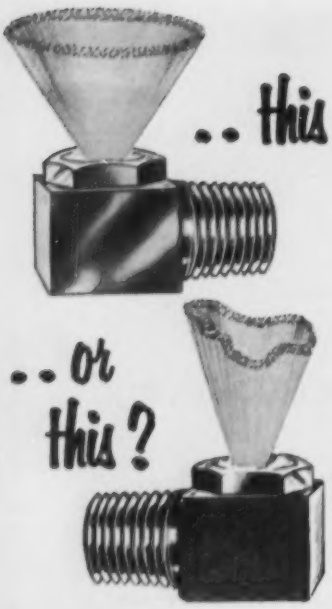
But Trent put a stop to that – simply by going into partnership with gravity. With their exclusive *Contour-Welding* process, they weld at the bottom – and gravity works for them. For then, the bulge is in the opposite direction – blending in perfectly with the contour of the pipe itself.

TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

For more data, circle this page number on card at back →



BE SURE OF A PERFECT CONICAL SHAPE SPRAY ALL THE TIME WITH *Monarch*

For a perfect spray. Many food processing plants prefer Monarch nozzles.

This advanced design nozzle reduces clogging and guarantees dependable food processing applications to

- WAX FRUITS
- RINSE VEGETABLES
- POWDER MILK
- DRY EGGS
- WASH FILTER CAKE
- HUMIDIFY BANANA ROOMS

Send for catalog I

Monarch
MFG. WORKS, INC.
2517 E. ONTARIO ST.
PHILADELPHIA 34, PA.

Useful New Books & Government Publications

Power of the Consumer

ECONOMICS OF CONSUMPTION *by W. C. Cochrane and C. S. Ball. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York City 36. 1956. 481 pages. 6¼ x 9¼ in., cloth. Price:* $6.50.

Combining theory and statistical analysis with up-to-date description, book provides the key to decision-making in the household. It strives to develop an understanding of the decision process, as well as its nature.

The behavior of individuals and groups is covered. Book also includes a discussion of income statistics.

Key Line Operation

MODERN CHEMICAL PROCESSES, *Vol. IV Published by Reinhold Publishing Corp., 430 Park Ave., New York City 22. 1956. 202 pages. 8 x 11¼ in., cloth. Price:* $5.

Fourth in a series designed to provide an up-to-date reference to modern chemical processes, book contains information of definite value to food plant management.

Of the nineteen processes illustrated and explained, three deal specifically with food: Malting, Salt Manufacture, and Vegetable Oil Refining. Information on background, installation, operation, economics, and personnel is included for each. A forecast of changes and technological improvements is also presented.

Applied Fluidization

FLUID FLOW IN PRACTICE *edited by J. R. Caddell. Published by Reinhold Publications Corp., 430 Park Ave., New York City 22. 1956. 119 p. 5¼ x 7¼ in., cloth. Price:* $3.00.

Based on an "experience in industry" symposium, sponsored jointly by the Philadelphia-Wilmington Section of the American Institute of Chemical Engineers, and the University of Pennsylvania, book contains data on the applications of fluid flow in industry. Discussion is restricted to the flow of liquid, including slurries in pipe line and pumps, and to simple applications for gases.

It begins with a review of basic principles needed to understand fluid flow problems. Difficulties involved in design, selection of components and equipment are covered. Last chapter discusses trends in research.

The Economic Mind

AN INTRODUCTION TO ECONOMIC REASONING *published by the Brookings Institution, 722 Jackson Place, N.W.,*

FE REPRINTS AVAILABLE

Difficult-to-find practical information on food plant operations and materials is available in the "roundup" reports and articles listed below. Single-copy reprint prices are given. For orders of 20 or more, there is a 25% discount. You order the reprints by circling the corresponding numbers on the Reader Service Coupon, inside the back cover. You will be billed when your order is filled.

8. Newer Ingredients.....$1.25

Twenty-page report on the newer ingredients which aid in producing better food products (May, 1952). It includes detailed articles on these subjects: (1) Guide to Optional "Chemical" Additives. (2) Antioxdants Provide New Flavor Controls. (3) Industrial Enzymes Now Speed Natural Processes. (4) Food Emulsifiers Bring New Highs in Uniformity. (5) Seaweed Extractives Find Versatile Uses in Foods.

9. Vacuum Cooling.....$0.75

Eight-page special report covering the use of efficient vacuum cooling in a wide variety of food processing operations to save costly process time, reduce labor, increase output, and avoid spoilage losses (October, 1952). Preference data for specific types of applications are presented in this engineering study.

10. Packaging Materials.....$1.00

Sixteen-page report on how to get better production-line performance with packaging materials and containers (March, 1952). It includes these comprehensive articles: (1) Develops Your Package for High Output. (2) How Properties of Materials Affect Packaging Speeds. (3) Nipping Production Slowdowns by Prechecking Supplies. (4) Tips on Ordering Materials for Top Performance. (5) Proper Storage of Your Stock Averts Line Headaches.

11. Sanitation $0.50

Six-page report on "How To Assure Top Sanitation in Your Processing Equipment" (Jan. 1952). This report was a preprint of one section of a practical book on food plant sanitation prepared by Association of Food Industry Sanitarians.

12. Materials Handling.....$1.00

Twelve-page report entitled "How Modern Materials Handling Gives New Spurt in Processing" (March, 1951). Case histories of important savings through more efficient handling are presented. And the different types of handling equipment are described and illustrated.

13. Mixing $0.50

Four-page roundup of progress in plant mixing methods and equipment, plus a forecast of what is ahead (Oct. 1953). Performance data are included as yardsticks of what can be achieved.

14. Aseptic Canning.....$0.75

Eight pages, including foldout picture flowsheet, describe, evaluate, and illustrate in detail the continuous, short-time, high-temperature aseptic canning process that won the 1951 Food Engineering Award. (June, 1951).

Washington 6, D. C. 1956. 335 pages. Cloth. Price: $3.

How do free markets function?

Can we control business cycles?

What is the impact of labor unions on worker, employer, and economy?

These and many other challenging questions may be answered with the method of analysis presented in this book. Readable and absorbing, the work provides the layman with the key to economic reasoning, enabling him to cope with the continuing flow of information, special pleading, and advice.

Current economic problems are used as examples in tracing the fundamental principles of economic reasoning. Charts provide further ellucidation.

Filters in Industry

FILTRATION MANUAL FOR PRODUCT DESIGNERS *published by Purolator Products, Inc., Rahway, N. J. 1956. 32 p. 8½ x 11 in., paper. Price: $1.*

Handy as a single convenient source of data on filters and filter application, manual collects most of the recent information on developments in filtration and filtration equipment. Information needed by a design engineer for early planning and development work is included.

Simple methods for determining filter size are given when it is technically practical. Applications which require special study, however, are not neglected.

Booklets and Reports

VACUUM REQUIREMENTS FOR CANNED TOMATOES. *Published by Quartermaster Food and Container Institute, Chicago 9. 64 pages, paper. No charge.* Proceedings of Department of the Army symposium.

19TH ANNUAL TIME AND MOTION STUDY AND MANAGEMENT CLINIC. *Published by Industrial Management Society, Chicago 1. 152 pages. Price: $3.* Transcripts, charts, forms, and illustrations cover proceedings of clinic.

FACILITY DESIGN UTILIZING GAMMA RADIATION FOR MEAT PASTEURIZATION (*TID-8002*). *Published by Atomic Energy Commission, Washington 25, D. C. 13 pages, paper. Price: 20¢.* Monograph in Industrial Atom series.

1956 DIRECTORY OF PUBLIC REFRIGERATED WAREHOUSES. *Published by National Association of Refrigerated Warehouses, Washington 5, D. C. No charge.* Listing of member plants,

With TEFLON-faced guide rails, on conveyors and packaging machines, handling spoilage is minimized, sanitation is simplified, packages do not become streaked or smeared. Why? Because nothing sticks to TEFLON, the slipperiest material known. Chemically inert, having zero moisture absorption, tasteless, odorless—TEFLON also prevents food contamination and is the easiest material to keep clean.

TEFLON-faced steel guide rails are fabricated by the United States Gasket Company in any length up to 12 feet and in widths from ⅛ in. to 2½ in.

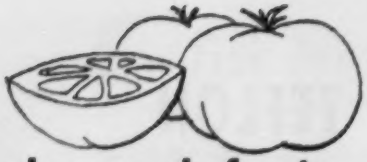
duPont TEFLON is bonded on ⅛ in. steel bar leaving the surface unmarred by mechanical fasteners. Shot-welded studs on the metal side are provided at designated points for attaching to equipment. Special shape guide rails are also available to specifications.

Ask your U. S. Gasket—Belmont Packing Distributor or write for Bulletin No. GR-301.

UNITED STATES GASKET CO.
Camden 1, New Jersey

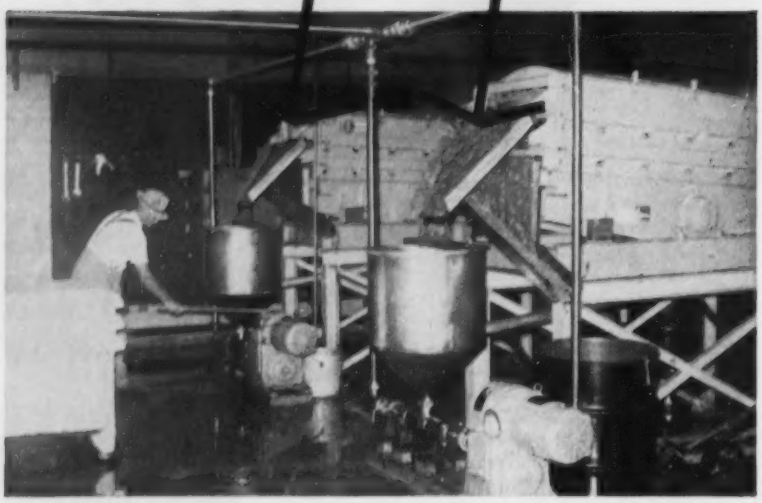
U.S. GASKET • BELMONT PACKING

JUICE



without specks or defects

Even from badly cracked tomatoes with these SIMPLICITY SCREENS



FRANCIS C. STOKES COMPANY, one of the country's largest tomato seed producers, reported that the installation of FIVE SIMPLICITY TOMATO SCREENS resulted in a marked improvement in their operation, quality-wise. They found that even when handling badly cracked tomatoes, they obtained juice which was relatively free from black specks, or defects. The screen's operation resulted in quite a saving on trimming labor.

Simplicity Double-Deck Screens are specifically designed for better seed removal. Stokes reported excellent germination of the tomato seed removed.

Simplicity Screens improve tomato processing because their efficient balanced gyrating action and larger screening area provide as much as 50% more handling capacity. A richer tomato product results when all the juices and pectin are scrubbed from the skins by the action of the screen.

Simplicity all stainless steel construction and removable trays cut cleaning time to a minimum. Check with your Simplicity representative today!

FOR INFORMATION ON SIMPLICITY TOMATO, DEWATERING, AND SEWAGE SCREENS, WOVEN WIRE SCREEN CLOTH AND VIBRATING CONVEYORS, WRITE . . .

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 17, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario
FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

with storage space, personnel, railroad lines, insurance rates, investment figures, and special services.

REQUIREMENTS FOR THE SANITARY PRODUCTION OF SWEET CREAM AND MILK FOR MANUFACTURING. *Published by Dairy Products Improvement Institute, Ithaca, N. Y. 48 pages, paper.* Manual and statement.

Omar's Evaluation Program

—*Continued on page 51*

of candidates to fill these anticipated vacancies, as indicated in the evaluation program. Any deviation between "neededs and availables" is immediately apparent. Thus, additional training or expanded recruiting efforts may be indicated. This is perhaps best illustrated by our accompanying management inventory sheet.

Now, from the evaluations, individual promotion lists are made for every major job classification. On these are posted the individual's name, job title, age, years of Omar service, present job service, current performance rating, future executive position recommended, and time expectancy.

It has been found that such information is extremely valuable in the day-to-day planning of company expansion programs, as well as for filling vacancies within the organization.

Why Supers Okay It

The company has found supervisor approval of the program wholehearted, in fact almost overwhelming. Supervisors say they are at last confident that both they and their work are being very carefully analyzed and discussed.

They now are certain that their individual status is being recognized by top management. And furthermore they feel that future decisions as to their training and promotion, will not be based simply on a passing concept of just any given member of management.

A prime factor promoting supervisory approval is the number and extent of advancements attributed to the program in less than its first two years—namely, 58 promotions and 36 desirable transfers.

How Management Sees It

As for management's appraisal, a brief of the effort tells the story:

Each district manager personally gives one to three days (depending on size of his district) to exclusive analyzing, discussing, and finally approving of all ratings of employees.

In turn, a two-day officers' meeting specifically reviews and approves all company evaluations. Here, each district manager, as well as Omar individual officers and department heads, discuss their opinions—pro or con—relative to each supervisory person.

It is doubtful that the top management of any other food company spends as much time doing this kind of evaluation. The fact that the president and officers gladly devote themselves down to the very details illustrates the importance they place on the overall evaluation program.

Ups Employee Morale, Too

The company has reported the program to all personnel—in as much, or more, detail as appears here—both in the employee publication and via other media. And this has had a valuable impact on worker morale.

Employees now consider the promotional doors "more open"—encouragaing them, if they're ambitious enough to want advancement and determined enough to make the effort to get it.

Further, they now believe promotion is something to aspire to, because they realize that their work performances are being judged fairly and impartially.

As yet, Omar has no standard procedure for selecting rank-and-file workers for assignment to first-level supervision. However, this training of all management, from first level on up, has definitely augmented the management's ability to pick better men from the ranks. And the result has been a general uplift of employee spirit.

What Management Has Learned

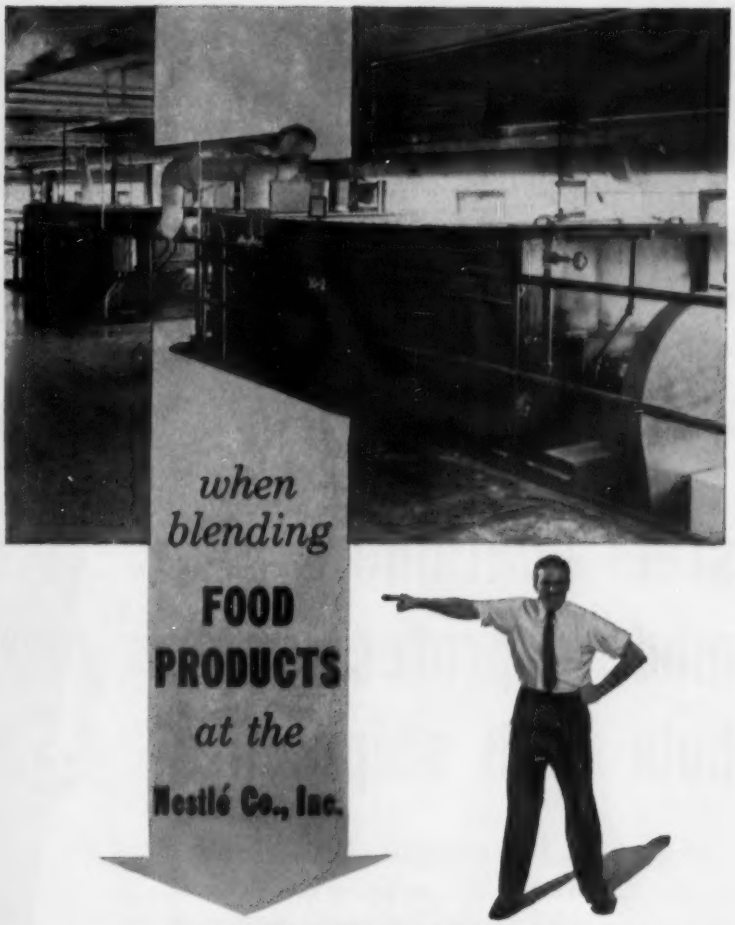
The procedure constantly gives management much beneficial information. Thus, individual training and counseling programs are sharpened.

In addition, the various charts simplify the analyses for drafting training needs and developing and instituting the programs. The system effectively brings to light the men most "likely" for executive posts and who, therefore, should receive executive development.

Still another important factor: Those supervisors whose work falls to unsatisfactory grade are thus readily spotted. They are then subject to being probationed.

This involves a positive program for the man's improvement. Committed to writing, discussed with the probationary worker, and then put into effect, this plan is designed to "lift back" the employee, both for his own welfare and that of the company.

End (Resume reading on page 52)



DAY JUMBO MIXERS . . . meet every requirement for maintaining a thorough blend of chocolate products under sanitary conditions at The Nestlé Company, Inc., Fulton, N. Y. For instance: seals may be furnished of sanitary construction requiring no packing, and of such simple design as to permit thorough cleaning in a matter of minutes between batches—(no more black specks working into product from stuffing boxes).

Outboard bearings on all models allow plenty of room for normal cleaning and maintenance. Special agitators available for blending high shortening content products. Heating or cooling jackets, dust covers and many other optional features available. For complete information write for Bulletin 800.

in mixing equipment DAY *means longer life span*

FOUNDED 1892

THE J. H. DAY COMPANY

4932 BEECH ST., NORWOOD, CINCINNATI 12, OHIO
Division of Cleveland Automatic Machine Company

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
Western Canada: British Canadian Importers, Vancouver, British Columbia
Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5—D.F.

For more data, circle this page number on card at back →

Continental's Perma-Lining gives 100% coverage plus uniform film thickness

Continental's *Perma-Lined* steel containers give modern protection to bulk food shipments

Now, the 100% protection of Continental's sanitary Perma-Lined steel shipping containers is available for foods. Hot-sprayed within the formed container, and fast-baked, tough enamels cover every square-inch of inner surface. Even side- and bottom-seams, often a problem, get complete, uniform coverage.

Backed by our vast experience in tailor-made packaging, Continental Perma-Linings are available for almost every food product. In addition, our research department is fully prepared to develop new ones for your special use.

Why not put modern Perma-Lined steel containers to work for you? Just call your Continental representative.

TRUE-TO-LIFE TORTURE. When the weight on this impact-tester drops, Perma-Linings must stand up to the same hard knocks they often receive in bulk food shipments. Never-ending research by Continental scientists assures Perma-Lined steel containers of the highest quality.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

EURB to Test Potato Flake

Market tests of a new potato flake, developed by USDA's Eastern Utilization Research Branch, will be made in '56, announces the EURB.

The new instant product needs only addition of water and milk, say the researchers, to make a delicious mashed potato.

Maine Potato Commission is supplying a carload of tubers for processing in EURB's laboratory pilot plant. And two marketing specialists from the Maine Dept. of Agriculture will supervise test packaging design and marketing studies.

Additives Cut Rice Oil Loss

Costly losses in rice oil manufacture have been drastically cut from 44% to a low of 17.4% by adding various compounds at starting point of the alkali-refining process, states USDA's Southern Utilization Research Branch.

Blackstrap molasses, sucrose, ethanolamines, and various alcohols have all been used with great success. Star performer, to date, is monoethanolamine. In lab tests, addition of only 1.8% of this chemical boosted production yields 23.6%.

Ships to Move Bulk Wine

Plans are being speeded for West to East shipment of bulk wine in tank ships, states California Transcontinental Wine Co., Fresno.

The company, which annually markets 5,000,000-6,000,000 gal. of wine in the East, is now seeking terminal facilities. Here, wine would be pumped from ship to tank truck for regional distribution.

Reason for the move, declares company's board of directors, is the high rate charged by railroads for bulk wine shipment.

U. S. to Sell Ghee

The Pakistan Embassy has agreed to buy 3,527,000 lb. of ghee in No. 10 cans from U. S. manufacturers. Purchase price is $2,460,000 and includes ocean transportation.

Contract and shipping periods run from April 20 to July 16, 1956. USDA is financing the deal.

Budget Hike of 15% Sought by FDA For Inspection, Manpower Boost

Aiming for a big lift in its inspection activities this year, FDA plans to quickly win back some of the ground lost as a result of past budget cuts.

Right now, its hopes ride on the Senate outcome of a $995,000 budget hike, sought by President Eisenhower and approved last month by the House. FDA is likely to get this additional money—giving it about $6,779,000 to spend in the fiscal year starting July 1.

About two-thirds of this addition will be earmarked for staff increases. Balance will go to meet increased housekeeping and travel costs.

A vigorous recruiting program, already underway, will be further stepped up this year. FDA now has 258 inspectors, 31 more than it carried last year. Goal is 308 by June 30, 1957.

Marion B. Folsom, Health, Education, and Welfare Secretary, says increase will permit FDA to inspect 13,800 establishments next year. This is 24% more than estimated total for this year.

Also, Secretary Folsom plans increased inspection of imported foods. Such examinations will total 24,000 this year, 29,000 next.

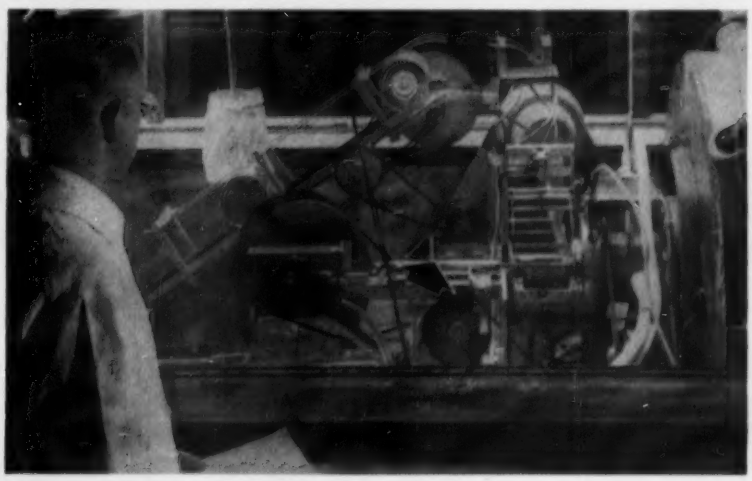
In trying to meet its program, FDA sees trouble from two sources. First, it's getting increasingly difficult to recruit capable people for the inspection service. And second, the work load gets heavier with each year's increase in food output.

Manpower sought by the agency—college graduates in chemistry—are not attracted by the comparatively low salary of an inspector, which starts at $4,300 per year. Industry will pay these men $5,000 or more initially.

Both Secretary Folsom and FDA Commissioner Larrick emphasize, however, that the projected inspection increase will only bring the agency up to its 1950-53 level of activity. And the manpower boost will just bring personnel strength up to the 1952 figure.

But Commissioner Larrick has other plans for improving his agency's effectiveness. This year, FDA will launch a search for new and simpler methods for analyzing products. And part of the budget boost will go for

(*Turn page*)



Pilot Project for Food Radiation In Action

Unsterilized cans of food are subjected to intense gamma radiation in tests conducted by the Army Chemical Corps, which is seeking to solve problems of the new preservation method. Conveyor drops containers into position, and a rod (arrow) pushes cans through tank (right) that contains radioactive fuel rods from atomic reactors. Degree of radiation is adjustable by varying rod speed. (U. S. Army photo)

Industrial TV Makes Big Strides Following Equipment Price Cuts

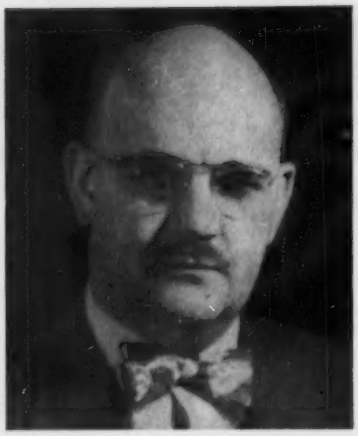
As a result of lowered prices, closed circuit television is making rapid strides in industry today, according to McGraw-Hill's economics department. Virtually unheard of 10 years ago, this tool should interest all food processors who are eyeing automation of their product lines.

Principal attraction of this TV is that a camera can be placed where it is not safe or convenient for a human to go. Further, it saves manpower, cuts accident hazards, and lessens chance of human error in process control.

Once a camera is placed, it can be left unattended. Aim and focus are adjusted from a distance by remote control. And unit can be set to monitor anything from a single dial to an entire line.

Unlike home reception, closed circuit pictures are transmitted by a coaxial cable, and can be picked up only by receivers connected to the line. Such a system permits closer plant control by permitting viewer to observe widely dispersed operations from a single, centralized point.

In the past, cost of equipment ranged from $5,000 to $9,000. Now, a camera-and-monitor station runs between $1,000 and $5,000. Maintenance, including replacement of expensive camera tube, figures out about $750 per year.



Gains Chemistry Honors

The 1956 Borden Award for research in milk chemistry was presented to Dr. Sam R. Hoover, assistant chief of USDA's Eastern Utilization Research Branch, at recent American Chemical Society annual meeting. During presentation, ACS President J. C. Warner made special note of Dr. Hoover's discovery of the specific milk protein groups responsible for water absorption by casein. This basic research, he added, was of extreme importance in development of improved dried milk powders.

FDA Budget Hike (Cont'd)

scientific personnel to staff field laboratories.

On the long-range picture, a task force headed by Deputy Commissioner J. L. Harvey is already working on fiscal budget 1958. And all field offices have been questioned as to their most pressing needs.

This planning is in line with recommendations made by the Citizens Advisory Committee that surveyed the Agency last year. They advised an expansion of three to four times present strength within the next five to ten years.

The budget increase of 15%, now sought by the Administration, is in line with this committee's suggestion of a 10-20% hike the first year of the expansion program.

USDA Studies Milk Dryers To Gage Efficiency

What is average processing efficiency in a milk-drying plant? To gage the answer, USDA researchers studied operations in 12 plants from New England to the West. Here's the results:

Yield of non-fat dry milk solids (NFDMS) averages 8.96 lb. per 100 lb. of skim milk. This is 96% of actual solids (9.08 lb.), which contain a small amount of fat.

However, individual processors range all the way from 89% of perfection to nearly 100%. Average drying losses run 4% regardless of whether spray or roller drying techniques are used, and whether plant receives whole or skim milk to process.

Also, NFDMS-yield is directly tied to original butterfat content of the milk. Yield averaged 8.76 lb. NFDMS per cwt. when whole milk tested 3.5% fat. Each 0.1% increase in fat test boosted NFDMS yield another 0.05 lb.

U. S. Gives Freeze Aid

Emergency relief to European countries—hard hit by recent freezes—now totals 185,000 tons of wheat, dairy products, potatoes, and grain feeds. But there is still no firm estimate of total crop damage, and its future effect on U. S. exports and surplus products.

Greece, France, Italy, Spain, Portugal, and Turkey have all shared initial food shipments, made on a straight giveaway basis under President Eisenhower's special offer.

These have been small, however, when gaged against normal U. S. exports—and may very well be expanded when damages are fully added up.

Air Blast Unloads Truck

Bulk sugar handling gains new speed with this 20-ton-capacity, pneumatic discharge truck. A 20-ton-per-hr. blower system, built into carrier, blasts sugar up to a height of 90 ft. into customers' tubular receiving lines. California and Hawaiian Sugar Refining Co., San Francisco, has recently put six of the new units into service.

Cocoa Men Pick Leaders

Re-elected to lead the Association of Cocoa & Chocolate Mfrs. of the U. S. in 1956 are the following officers:

President, C. C. Day, Nestle Co.; vice-president, L. W. Majer, Hershey Chocolate Corp.; secretary-treasurer and general counsel, G. P. Peyton, Washington, D. C.

Analyst Eyes Frozen Meats Predicts Big Rise By 1965

"Packers have far more to gain than to lose by going into frozen meats, if only for the advantage of brand recognition." Such is the conclusion of Milton E. Bevington, market analyst for Dewey & Almy Chemical Co.

After interviewing a wide range of packers, freezer manufacturers, grocery chains, institutons, and others, he estimates frozen meat consumption, by 1958, will be 2- to 4-times present production (about 325,000,000 lb.). And that by 1965, processors will freeze 25-50% of total production.

This will occur, asserts Mr. Bevington, despite added cost of freezing and holding facilities, and necessity for more reefer transports.

For, the big packer can gain greater profit margins by maintaining brand identity, and by using freezer storage to level out price cycles—thus eliminating distress sales.

FDA Week Set for June

Special attention will be paid to Food & Drug's 50th anniversary through proclamation of a national Food & Drug Law Golden Anniversary Week, scheduled for June 24-30, 1956.

At this time, the food industry will join drug, chemical, and cosmetic fields in helping enforcement officials and consumer groups celebrate the event. Climax of the week will be jubilee ceremonies in Washington, D. C., on June 27, where a 3¢ stamp will be issued to commemorate the 1906 act.

To date, governors of five states—Massachusetts, New Jersey, Georgia, Tennessee, and Florida—have also reserved these seven days for FDA observances.

Hors d'Oeuvres

▶ Secretary Benson recently told pork processors to watch their marketing margins and profits. Being so small, these margins and profits are pretty difficult to see. But the packers do watch them, Mr. Secretary, and very closely. Else they would disappear entirely.

▶ **The Secretary, of course, is interested in farmers. Just like the Congressmen who voted for farm votes when they passed that mixed up mess of a farm bill.**

▶ Apparently the idea was to put Ike into a political sandtrap. But he blasted out with his veto message.

▶ **Americans now eat 17.2 billion more eggs annually than they would if eating habits had remained the same as in 1940. Seems most people change their diets when their purses get fat.**

▶ New York's recent International Food Show introduced a new cocktail—vodka in passion fruit juice. A personal H-bomb.

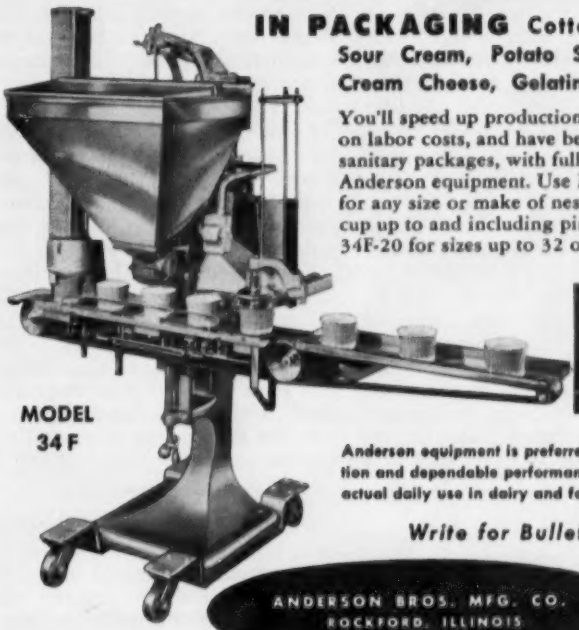
▶ **Rate of child-bearing by American women rose 11½% between 1950 and '54. Looks like old-fashioned motherhood is back and baby foods are here to stay.**

▶ Speaking of babies, Swift recently sponsored a name-the-baby contest in which the top prize was the weight of the winner's baby in gold (cash equivalent). Shows a good understanding of values.

▶ **Several-days-old bread is being turned into tasty tidbits. A West Coast bakery dices the stiff, dry loaves, enrobes the pieces with a hard-butter coating, puts them into bags, and sells them for a dime. Demand for this TV-snack exceeds the supply. Looks like they'll have to make stale bread on purpose.**

▶ 'Tis said that at least 75% of all the packageable produce still is not packaged. But to judge by the mob at the recent Packaging Exposition, several thousand guys are out to correct that situation.

SPEED... SANITATION... SAVINGS...



IN PACKAGING Cottage Cheese, Sour Cream, Potato Salad, Honey, Cream Cheese, Gelatine Salads

You'll speed up production, save a fortune on labor costs, and have better, more sanitary packages, with fully automatic Anderson equipment. Use Model 34-F for any size or make of nesting round cup up to and including pints . . . Model 34F-20 for sizes up to 32 ounces.

DISPENSES—FILLS AND CAPS 18-58 PER MINUTE

Andersen equipment is preferred for simple operation and dependable performance — proved by actual daily use in dairy and food plants.

Write for Bulletin 5-10

ANDERSON BROS. MFG. CO.
ROCKFORD, ILLINOIS

TO WHOM MONEY MAY CONCERN:

If your production costs are higher than they ought to be, you very likely can do something about it. Often one change in a method or process can make the difference between loss and profit. We'd like a chance to consult with you and see if such a change in method won't improve *your* profit picture. (It certainly has paid off for many other firms). The best part is, that it won't cost you one cent to find out. Just clip the attached coupon and mail it. When you do, one of our trained conveyor belt representatives will visit you to discuss and examine your particular problem and offer suggestions that will show you how Cyclone Metal Processing Belts may cut your production costs below the ulcer level. These suggestions will be tailored to YOUR problem . . . and no obligation. How can you lose? Do it, today.

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

MAIL THIS COUPON

Cyclone Fence
Dept. H-56, Waukegan, Illinois

Please have your trained representative call on us to discuss our production problems.

Name .....
Company .....
Address .....
City ..... State .....

USS

UNITED STATES STEEL

Researcher Accents Design Pointers From Package Market Studies

"Packaging is not just the label or color on the box. It is total presentation of the product to the consumer—in the shape or form he wants to buy", stressed Richard Manville at American Management Assn.'s recent National Packaging Conference in Atlantic City.

To point this up, Mr. Manville (Richard Manville Research, New York City) cited three 'before-and-after' examples from the food industry.

First, a study was made of "Taste O' Sea Frozen Fish Fillets", distributed by O'Donnell-Usen Fisheries, Boston. It disclosed that the package needed more appetite appeal, finished product legibility, and a wrapper that would permit advertisement of other products in the line, he declared.

To gain these ends, twelve new designs were prepared, mounted on dummy packages, and exhibited to a carefully selected group of women. They were asked, among other questions, which design caught their eye.

Winner was a mouth-watering, 6-color gravure showing a broiled fillet. When product was marketed in the new overwrap in 1955, sales jumped 50%, against an industry gain of only 15%.

Further, studies by DuPont, states Mr. Manville, show that customers spend 90 sec. per purchase in self-service food stores. And a given package has only 2 sec. to stop the shopper's eye!

This was dramatized, he declared, in the case of Bunte Bros. candy. The old package gave more prominence to conmpany name than to product identification. And product designation often consisted of three or more words, where one would do better.

In the new package, instead of calling the product "banquet mints", it was simply designated "mints". This title was featured across the width of the entire bag. And packages were printed in different, metallic-ink colors that harmonized with bag contents.

In one marketing test, the new package outsold a competitor by 37%—even though Bunte's candy was priced 4¢ higher.

Best brand identification, says Mr. Manville, calls for a color symbol, then a name, then a slogan—in that order.

Several years ago, General Mills' Betty Crocker Brand had weak brand and family identification, and lacked quality emphasis. To correct this, GM boosted brand identification with a strong oval symbol, and stressed quality with better illustration. The family-line resemblance was heightened by use of a consistent color on all packages.

Result: GM has quadrupled its cake mix sales over the past five years, while general market for this product has merely doubled.

Antibiotic Dip Plus Ice Boost Fish Freshness

In the future, maximum protection for fresh-caught fish will probably be obtained by combining a solution dip with storage in antibiotic-ice, claims Dr. Alex A. Malaspina, Chas. Pfizer & Co., Inc.

The dip—a 50-100 ppm. concentration of the antibiotic,—quickly inhibits surface bacteria, he explains. Storage in ice, to which is added 5 ppm. of a broad-range antibiotic, completes the job of combating bacterial spoilage.

This procedure, claims J. D. Langlois, of the same company, will greatly extend fishing voyages and level out canning and freezing production.

These benefits should offset the initial cost of the process, he adds, now estimated at ¼ to ½c per lb.

Appert Award to Proctor

Recipient of the 1956 Nicholas Appert Medal is Dr. Bernard E. Proctor, Head of Food Technology Dept., Massachusetts Institute of Technology, Cambridge. Presentation will take place during the 16th annual IFT meeting in St. Louis, June 10-14.

Dr. Proctor is noted for his research studies in "cold sterilization" of foods.

Bulk System Speeds Raw Sugar Handling

A staggering total of 110,000 tons of raw sugar is piled in these bulk receiving bins at the California & Hawaiian Sugar Refining Corp. plant at Crockett, Calif. Handling system, which includes three similar collecting depots in Hawaii, cost $9,500,000. It was devised to eliminate use of burlap containers, thus cutting handling costs and steamship loading and unloading times. Four large gantry cranes, equipped with drag-line buckets and elevators, remove product from ship holds. Conveyor network then whisks sugar through a hopper-type scale and deposits it in one of the nine steel bins.

Spore Test Checks Cook

Processors now have a simple and fast method for pinpointing efficient retort temperatures, announces American Sterilizer Co., Erie, Pa.

Test strips, treated with heat-resistant bacterial spores, are placed in retorts and processed with the food. After cook, strips are sent to American's laboratory where they are cultured to give sure evidence of sterilization index.

Control slips double check against inadvertent exposure of process cultures. Test strips are available coated with any of three organisms.

Dairy Men Pick Officers

Elected for 1956 are the following officers of the Dairy Products Improvement Institute, Inc.:

A. C. Fisher, General Ice Cream Corp., Schenectady, president; Dr. A. C. Fay, H. P. Hood & Sons, Boston, vice-president; R. C. Hibben, International Assn. of Ice Cream Mfrs., Washington, D. C., treasurer; and Dr. A. C. Dahlberg, Dairy Products Improvement Institute, Inc., Ithaca, secretary and advisor to board.

Summer Food Courses

Two short courses in food engineering and chemistry are scheduled for presentation this summer.

At Massachusetts Institute of Technology, "Perspectives in Food Technology" will cover instrumentation, ion-exchange, filtration, dehydration,

sanitation developments, and other food engineering aspects from June 18-29, 1956.

Sponsored by American Oil Chemist's Society, a course at Purdue U. will deal with various angles of oil refining, filtration, extraction, and related operations. Dates are July 16-20.

Managers Must Aid Labor States NCA President

More concentration should be given to human relations in the food industry, urges William U. Hudson, president, National Canners Assn.

For, enthusiasm and good morale among employees does not generate spontaneously. It filters down from top management.

Thus, employers should learn that workers crave recognition and economic security, even above such factors as wages and hours.

Advancing technology, while beneficial, increases instability, states President Hudson. To counteract this, management must solve problems in industrial relations. The job cannot be done by government.

Briefly . . .

● **NEW FLOUR MILL will be built near Port-au-Prince, Haiti, at a cost of $4,500,000, says the newly-formed Caribbean Development Co. Capacity of the ultra-modern plant will be 1,750 barrels of flour per day.**

● TUBED FOODS are being tested by Army Quartermaster Corps for feeding jet pilots while they are aloft. Containers have space-saving advantage and pilot can eat contents without removing oxygen mask.

● **PACKAGE MACHINERY SALES, on the installment-buying plan, have more than doubled since World War II, according to a C. I. T. Corp. survey. Such purchases now account for over half of total sales.**

● NEW COIN VENDER, now being readied for production, turns out hot seasoned popcorn, sealed in a plastic bag. High frequency radio waves pop kernels on demand.

● **GENERAL FOODS has produced its first documentary film, "Harvest of Convenience", to show consumers how company processes its products.**

● NUTRITION OF MILK will be probed by American Dairy Assn. this year. Planned are three new research projects covering essential amino acids, protein in infant feeding, and fat absorption and transport in humans.

● **WASHED RAW SUGAR will be used exclusively by Maui Pineapple Co. for its '56 pineapple pack. Company has in-**

AUTO-LITE

for EYE LEVEL READING

Auto-Lite Temperature Indicators are ideal for use in processing and storage rooms, and for installation on equipment where temperature indication is desirable.

Model F-1 (illustrated) is available with maximum visibility dial; choice of temperature ranges from minus 60°F to plus 750°F; flexible tubing for remote reading or rigid stem for direct mounting. Adjustable electrical alarm contacts slightly higher. Priced from $22.

Send for new catalog describing Auto-Lite Temperature Indicators and Recorders.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

TEMPERATURE INDICATORS AND RECORDERS

VIKING "Sanitor" PUMPS

GIVE YOU

Sanitary Construction
Simplicity · Service

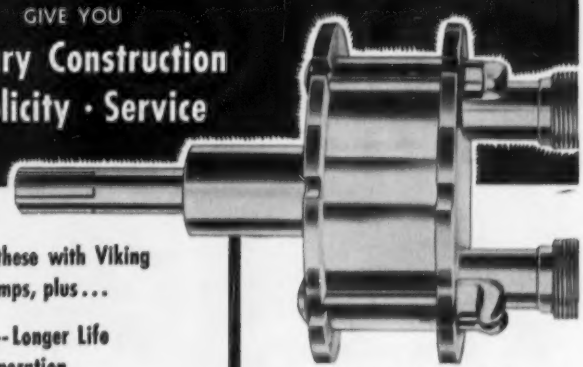


Fig. 175 Unmounted Viking "Sanitor" Pump

You get all these with Viking "Sanitor" pumps, plus...

- Fewer Parts--Longer Life
- Reversible Operation
- Even Flow
- Hydraulic Balance
- Slow Speed
- Self Priming
- Less Weight
- 3A Approval
- Easy Take-Down
- Fast Cleaning
- O-Ring Seal

It is the ideal pump for all types of liquid and semi-liquid food products. Sizes 20, 35, 50 and 90 GPM available in 39 models.

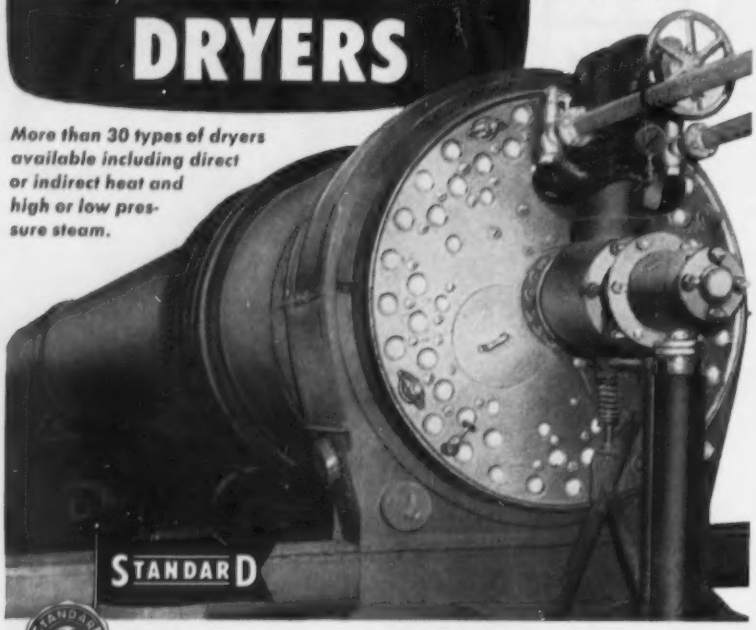
For complete information, send today for catalog section re.

VIKING PUMP CO.
CEDAR FALLS, IOWA, U.S.A.
In Canada it's "ROTO-KING" Pumps
SEE OUR CATALOG IN SWEETS

WRITE FOR OUR CATALOG
We are one of the World's largest manufacturers of Rotary Dryers.

STANDARD HERSEY DRYERS

More than 30 types of dryers available including direct or indirect heat and high or low pressure steam.



STANDARD STEEL CORPORATION
5045 BOYLE AVE., LOS ANGELES 58 • 15 PARK ROW, NEW YORK 45
DS-3

Coding Problem?
There's a Gottscho automatic code-dating machine for every package, every purpose

Bottom-Coder

This portable, space-saving unit imprints codes on bottom of jars, bottles, cans, etc. as part of an existing production operation. Imprint surface may be flat or concave, flush or recessed. Wheels right up to the line, can be moved about at will. ("Model TB" MARKO-CODER IMPRINTER).

Top-Coder

This motor-driven imprinting attachment places code-dates, other changeable legends on top surface of round or rectangular cans, canisters, jar covers, cartons, boxes. Attaches to conveyor or packaging machine. Gives consistently clean, sharp imprints . . . accurately positioned in any desired location on package top. (ROLAPRINTER "700" MACHINE).

Other standard Gottscho imprinting machines available for side-coding, label-coding, wrapper coding.

Submit details of your coding problem for appropriate literature and our recommendation.

Gottscho
ADOLPH GOTTSCHO, INC.
Dept. G, Hillside 5, N. J.
In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Automatic Production-Line CODING, MARKING IMPRINTING MACHINES

stalled an ion exchange unit to remove impurities.

● FOUR SCHOLARSHIPS in science and engineering, worth $6,000 each, have been established by Food Machinery & Chem. Corp. They will be governed by National Merit Scholarship Corp.

Action On Standards

Following actions have been taken by the Agricultural Marketing Service (AMS)–Food & Drug Administration (FDA) on U. S. Standards and allowable tolerances of various pesticides on raw agricultural commodities. References are to *Federal Register*.

Mozzarella cheese, part-skim mozzarella cheese, scarmoze cheese, part-skim scarmoze cheese, ricotta cheese, and part-skim ricotta cheese, Standards of Identity, *F.R.*, Mar. 15, p. 1658.

Cheddar cheese, AMS proposed establishment of U. S. Grade Standards, *F.R.*, Mar. 28, p. 1889.

Barley, AMS proposed revised U. S. Grade Standards, *F.R.*, Mar. 28, p. 1887.

Asparagus, canned, AMS proposed amendment U. S. Grade Standards, *F.R.*, Apr. 6, p. 2245.

Cheddar cheese, AMS establishment of U. S. Grade Standards, correction in *F.R.* Mar. 28, *F.R.*, Apr. 5, p. 2167.

On sweet potatoes, fat of cattle, goats, sheep, and swine, tolerances of DDT, *F.R.*, Mar. 31, p. 2112.

On almond hulls, grapes, almond meats, grapefruit, lemons, lettuce, pecans, tolerances of Systox, *F.R.*, Mar. 31, p. 2113.

Notice of withdrawal of tolerances of Diazinon, *F.R.*, Feb. 28, *F.R.*, Mar. 31, p. 2113.

On grapefruit, lemons, limes, oranges, tangerines, tangelos, and kumquats, proposed tolerances, *F.R.*, Mar. 17, p. 1702.

Schedule of Events

May

15–16—Armour Research Foundation and Nucleonics, industrial nuclear technology conference; Museum of Science & Industry, Chicago.

17–18—Society for Advancement of Management, material handling conference; Hotel Statler, New York City.

20–24—American Assn. of Cereal Chemists, annual meeting; Commodore Hotel, New York City.

22–23—National Flexible Packaging Assn.; Edgewater Beach Hotel, Chicago.

23–25—American Management Assn., general management conference; Hotel Roosevelt, New York City.

June

4– 6—American Society of Refrigerating Engineers, annual meeting; Hotel Sheraton-Gibson, Cincinnati.

5– 8—Material Handling Institute, annual

exposition; American Material Handling Society (5-7), conference; Cleveland Public Auditorium.

10–14—Institute of Food Technologists, annual meeting; Hotel Jefferson, St. Louis.

10–14—National Confectioners' Assn., convention & exposition; Hotel Statler and Mechanics Hall, Boston.

11–15—Society of the Plastics Industry, national exposition; New Coliseum, New York City.

17–30—Annual Material Handling Training Conference; Lake Placid, N. Y.

18–20—Grocery Mfrs. of America; Hotel Greenbrier, White Sulphur Springs, W. Va.

18–21—American Dairy Science Assn., annual meeting; U. of Conn., Storrs.

18–22—International Congress on Food Distribution; Rome, Italy.

20–22—National Macaroni Mfrs. Assn., annual meeting; Wentworth-by-the-Sea, Portsmouth, N. H.

20–22—Processed Apples Institute, annual meeting; Hotel Greenbrier, White Sulphur Springs, W. Va.

25–29—FAO Interim Committee on Fish Handling & Processing, international meeting of technologists; Rotterdam, Netherlands.

Steel-Belt Conveyors

—*Continued from page 68*

tion of 1 deg. from the horizontal.

Since small-diameter idlers are turned with greater difficulty than large ones, and also because they wear faster, idlers of 6-in. dia. are usually installed, being considered as nearest to the ideal size.

As for inspection of idlers, frequent observation of their running, even if only casual, is in order. For if an idler does not turn it will soon become flat at the point of contact with the belt and so require replacement.

Cleaners and Scrapers

As noted, a major advantage of the steel belt conveyor is the ease and assurance with which it can be cleaned and sterilized at the end of processing. Hot water, detergents, and steam can be applied to the hard metal surface without injury to the belt.

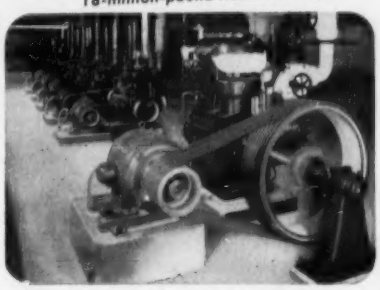
When food products in concentrated or slurry form, such as orange juice or coffee extract, are dried on a steel belt conveyor, a "doctor" or other type scraper is employed for effective removal of the dried product from the belt.

Other scraping and cleaning devices, such as rotary brushes, are employed to keep belts free of lumps, crumbs, and fine powders.

To prevent any foreign substances from being carried between the belt and the tension-end or tail-pulley, a plow-scraper may be installed on the return strand to sweep the belt clean.

Should pieces of metal, or other

Frick square-finned coils cool the 18-million-pound freezer storage.



Battery of 11 Frick ammonia compressors at So. Mich. Cold Storage Co.

FRICK Refrigeration

Carries the load at the Southern Michigan Cold Storage . . . measuring 324 by 160 feet . . . lately built near Benton Harbor.

Here eleven Frick ammonia compressors quick-freeze 375,000 pounds of foods daily at minus 30 degrees; store 18,000,000 pounds at zero; and hold a 75,000-bushel storage for fresh fruit at plus 30.

The frozen-food storage is cooled with 6,440 feet of the new Frick square-finned ceiling coils. Installation by Hayes Brothers, Inc., Frick Distributors at Indianapolis and South Bend.

Whether you need air conditioning, ice making, quick freezing, or other refrigerating services, you're safest when you specify FRICK. Write now for literature and estimates.

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA., U.S.A.

ASHWORTH NEW OMNI-FLEX® BELT

ECONOMICAL • FLEXIBLE

Let your production ride around corners on the new low cost OMNIFLEX belt. Short turning radius, light weight, easily installed and maintained.

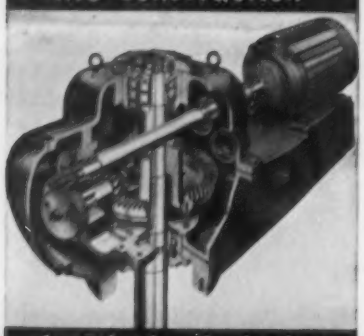
ASHWORTH BROS., INC.

WINCHESTER, VIRGINIA

Sales Engineers: Atlanta • Buffalo • Charlotte, N. C. • Chicago • Cleveland • Dallas • Detroit Greenville, S. C. • Los Angeles • Louisville • New York • Philadelphia • Rochester Seattle • St. Louis • St. Paul • Canadian Rep., PECKOVER'S LTD., Toronto • Montreal

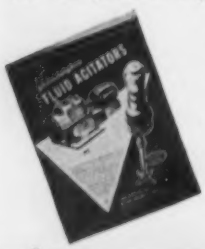
WRITE FOR ILLUSTRATED CATALOG OMC-56

COMPARE
the *Construction*



of Philadelphia
FLUID
AGITATORS

Exclusive Low Head Room Design—maximum bearing span with minimum headroom • Helical Change Gear Set, within housing, allows for ready selection of up to 14 standard speeds • Heavy Duty Thrust Bearings permit use of standard units for conditions of high pressure in closed tanks • Large Heavy Duty Output Shafting results in less shaft deflection at stuffing box or mechanical seal, steady operation of long overhung agitator shafts • Heavy Duty Inboard Bearing Support provides extra rigidity resulting in superior gear performance and life • Spiral Bevel Gears of Hardened Steel, accurately lapped for long and quiet operation • Field-proven Dry-Well Construction prevents oil leakage down output shaft • Labyrinth-type seal on input shaft allows effective sealing with minimum friction • . . . Plus a complete Fluid Agitator Engineering Service, backed by over 62 years of experience.



Write for Bulletin A2-55.

PHILADELPHIA
GEAR WORKS
INCORPORATED
ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA
BALTIMORE • CLEVELAND
Industrial Gears & Speed Reducers • LimiTorque Valve Controls

hard, solid substances, slip between the pulley and the belt, the latter is very likely to be damaged. Also if soft materials reach the pulley and build up on it, the belt may be thrown out of alignment.

To make certain there is no build-up of food products on the pulley, a pulley scraper may be installed above the "snow-plow" type scraper on the return strand.

Belt Alignment

If belts fail to "track" properly on the pulley, correct alignment usually can be restored by adjustment of the movable bearing of the head pulley. On a well designed conveyor, one terminal bearing commonly is equipped with a one-bolt adjustment for correcting improper tracking. Usually, just a fraction of a turn of the bolt is sufficient for readjustment.

Vertically mounted guide rollers, frequently installed to prevent belts from rubbing against any obstruction, serve to detect deviations of the belt as a result of misalignment and faulty tracking.

Guide rollers can also be employed to adjust limit switches. Or limit switches alone can be used to relay an electrical impulse to actuate either a hydraulic cylinder or electric motor for adjusting the pulley and thus correct alignment. Seldom does adjustment require a movement of more than $\frac{1}{8}$ in.

Belt Care And Maintenance

Tension of belts should be checked frequently, because proper belt tension is required at all times. To determine whether tension is correct, check the sag of the belt between the idlers of the lower strand.

The correct amount of sag will vary with the spacing between the idlers on the return strand, varying from $\frac{1}{16}$ in. on 10-ft. idler spacing to $2\frac{1}{2}$ in. for spacings up to 26 ft. Incorrect tension is rectified by adjusting the take-up bearings or changing the take-up counterweight.

This adjustment is the only one which may have to be made with reasonable frequency. It specifically should be made routine where temperature variations in processing operations cause belt expansion and contraction (which often result in changes in tracking).

It is quite important in such applications, and where adjustments are to be made manually, that supervisory personnel know exactly how to make the adjustments. These men accordingly can be responsible for correct tracking.

The steel belt itself should be inspected and checked regularly. Be sure that all edges are smoothly rounded, that there are no fatigue cracks. Also that there are no torn sections.

If the edges have turned up lips, or other roughness, they should be filed smooth to prevent the development of fatigue cracks. This smoothing of the edges may correct the rubbing condition which was responsible for the lip.

Now, if a fatigue crack is detected at the edge of the belt, cut out a crescent-shape piece where the crack appears and file the edges smooth. If a crack is discovered anywhere except at the edge of the belt, then drill small holes at each end of the crack to prevent it from spreading.

Joining and Patching

Should the belt be accidentally torn by severe impact, or by catching on some obstruction, then cut out the torn section and splice in a new piece of belting.

The procedure here is the same as employed for joining belt ends: First move the take-up bearings as far forward as necessary to overlap, and also to line up the ends, using a belt stretcher if necessary. The ends should be cut with shears at right angles to the sides.

Next punch rivet holes, using a "die-bar" as a guide. Then countersink the holes, put in the rivets, and hammer them home. Finally, file the rivet-heads smooth and level with the belt surface.

Whenever a steel belt conveyor is out of use for a long period—as is common between seasonal operations in some food fields—the belt should be removed from the conveyor, greased thoroughly, and wound into a tight coil, adequately secured. This is a particularly important protective measure when the conveyor belt is of the carbon steel type.

End (Resume reading on page 69)

Physicists' Techniques

—Continued from page 60

running and recording cooling and heating curves to obtain these measurements. The bath temperature is controlled by a potentiometer so that there is a constant rate of heat removal or input to the sample at all times. The curve is drawn by a recorder, actuated by a thermocouple in the sample. Sample container is designed for high sensitivity in detecting changes in slope of the curve, and only $\frac{1}{4}$ g. of sample is required.

Dough Rheology

From the point of view of the food technologist and cereal chemist, dough rheology should not be considered as an end in itself.

This was the opinion of I. Hlynka, Grain Research Laboratory, Winnipeg, Canada.

On the one hand, it may be used to establish the relation between measured physical properties of dough and the quality of the baked loaf. On the other hand, the rheological technique, together with test baking and analytical chemical procedures, will jointly contribute to the eventual elucidation of the molecular architecture of dough structure.

Because of their several limitations, load-elongation methods have not been used a great deal for fundamental studies. However, an interesting adaptation to dough rheology has been made. The method which has been called structural relaxation depends on the observation that properties of freshly mixed doughs or of doughs that have been worked change markedly with time.

The dough is said to relax. If a series of dough is stretched on the extensograph for different rest periods, allowed from the time the test samples are shaped, one obtains a school of load-elongation curves or extensograms.

To obviate the necessity of evaluating the strain, the condition selected as a common basis is the load at a constant sample deformation against time. This gives a structural relaxation curve which characterizes the properties of the dough tested.

The rheological basis of the structural relaxation method has not been studied adequately. However, it is reasonable to consider that extensograms constitute a family of curves, as has been shown by alveograms.

These curves are related through the stress-strain curves to the distribution functions. If the stress at a fixed sample elongation corresponds to a modulus on the distribution function in the same way for each of a family of extensograms, the structural relaxation method would then have a simple rational basis. Whether this assumption, as an approximation, is justified remains to be established.

Potential Role Of Nuclear Reactors

General requirements of a radiation source for ionization processing of foods was discussed by R. J. Beeley, Atomics International, Division of North American Aviation.

These fall into two general classes: (1) Fission products in various forms,

BOWSER

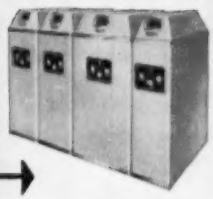
SYSTEMS SPEED LIQUIDS FROM RECEIPT TO DELIVERY

METERS & FILTERS

. . . control inventory and quality from storage or tank car through plant with meter-printed tickets for accounting of liquids handled.

PROPORTIONERS & BLENDERS

. . . eliminate costly batching with closed system compounding of liquid components. Accuracy yields uniform, controlled product.



FILLERS & PACKAGERS

. . . automatically control delivery and packaging of plant, process or end-product liquids faster at lowest cost with Bowser systems.

WRITE FOR CATALOGS

BOWSER NATIONWIDE SALES AND SERVICE

BOWSER PROGRESSIVE PROCUREMENT PLAN . . . all equipment available on lease or purchase payment program.

REGIONAL OFFICES: ATLANTA · BOSTON CHICAGO · CLEVELAND · DALLAS · KANSAS CITY LOS ANGELES · NEW YORK

BOWSER, INC., 1326 E. Creighton, Fort Wayne, Ind.

MON DIEU!

DREHMANN Joint filler

Harder, denser, corrosion resistant. For longer floor life be sure to specify Drehmann. Write for bulletin JE.

DREHMANN PAVING & FLOORING CO.
Originator of Brick Floors • Est. 1869
Gaul & Tioga Streets, Philadelphia 34, Pa.
507 Fifth Ave., New York 17, N. Y.

STEEL

Every Kind
Quick Delivery

Plates, Structurals, Bars, Sheets, Tubes, etc. Carbon, Alloy, Stainless Steels, Babbitt Metal.

RYERSON

Joseph T. Ryerson & Son, Inc.
Plants at: New York • Boston • Wallingford, Conn. • Philadelphia • Charlotte, N. C. • Cincinnati • Cleveland • Detroit Pittsburgh • Buffalo • Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco • Spokane • Seattle

Insure Uniform Quality Cooking

DOUBLE-CHECK with COOK-CHEX

The Easy-To-Use Cooking Indicator Tag

When a Cook-Chex is attached to a retort basket . . . *Anyone* in your plant can double check, at a glance, *two important* facts!

1. **The basket has, or has not, been through the cooking process.**
2. **It has, or has not, been subjected to *proper* cooking conditions.**

These two facts are important to you because they eliminate the usual problems of: a wrong cook schedule, keeping baskets in sequence, and the possibility of "losing" uncooked baskets!

Easy-to-use Cook-Chex signal these essential facts automatically! Cook-Chex, produced with a *purple* chemical ink, turn color to *green* only after your proper cooking conditions have been achieved. Cook-Chex react to precise conditions of temperature, steam and time; and, may be ordered to meet your specific cooking requirements.

Cook-Chex are also excellent as a low cost, permanent record for your cooking-room operations.

Double-check with Cook-Chex to insure uniform quality in your food products. Send for supply of Cook-Chex samples.

ATI COOK-CHEX

Another product by ASEPTIC-THERMO INDICATOR COMPANY

Aseptic-Thermo Indicator Company
11471 Vanowen St., North Hollywood, Calif.

Please send a FREE supply of Cook-Chex for use with a cooking process of _____ degrees F., for _____ minutes.

FE-5

Name _____

Position _____

Company _____

Address _____

City _____ Zone ____ State _____

and (2) materials made active by exposure to the neutron flux in a reactor.

Of the latter, three are of interest: Cobalt-60, which can be produced in existing reactors and transported to an irradiation facility; sodium-24, which is produced as a byproduct in sodium-cooled power reactors and must be used on the reactor site; and manganese-56, which is best produced in a reactor expressly for this purpose, and which must be used on the reactor site.

Measuring Food Quality

A new instrumentation setup that makes it possible to record the spectral transmittance curve for intact fruits and vegetables was described by K. H. Norris, USDA, Beltsville, Md.

The block diagram consists of a grating monochromator to illuminate the sample, an integrating sphere to collect the light transmitted by the sample, and a recording photometer to measure and record the light energy incident on the sphere surface.

In the instrument assembled in the laboratory, a variety of sources has been used, including the xenon-arc lamp, a zirconium arc lamp, and a ribbon-filament tungsten lamp. A Bausch & Lomb grating monochromator, with the addition of a synchronous motor to drive the wave length drum, provides the necessary spectral scanning for wavelengths from 200 to 1,400 millicrons.

Filters are used to eliminate second order energy, to remove stray light, and to adjust the spectral response characteristics. Sample is positioned on a sponge-rubber holder, which prevents the incident beam or any reflected light from entering the sphere without going through the sample.

The instrumentation has been used to measure the transmittance of samples varying in size from tomato seeds to large grapefruit. It is hoped that small watermelons can also be measured.

The following have been detected: Internal browning of apples not apparent from external appearances, small amounts of green in interior of otherwise full red tomato, internal black rot in potatoes, and blood in intact eggs.

This also appears to be a good method for indicating the average color of a sample, although it has not been evaluated for this purpose. It should also be possible to use this technique to measure and evaluate compositional factors that show strong absorption bands, within the wavelength range of the instrument.

Internal defects are difficult to detect, but here physical methods can be most readily applied, and other techniques cannot compete. X-ray units are now being used to inspect grain for the detection of insects within the kernel. Similar techniques can be used to spot internal defects in fruits and vegetables. The possibilities for much wider application of X-ray inspection are very good.

Transmission of visible light through agricultural products can also be used to indicate defects. This technique has been used to detect blood spots as small as $\frac{1}{8}$ in. dia. in intact eggs. It is also possible to detect various types of decomposition in eggs by these techniques.

Fluorescence measurements can be used to indicate internal as well as surface defects. Many of the common decay-producing organisms produce chemicals which fluoresce when exposed to ultraviolet light.

Unfortunately, numerous chemicals common in agricultural products fluoresce. But it is possible in many cases, by proper choice of excitation and wavelength, and by spectral analysis of the fluorescence, to distinguish the decay from the natural material.

Thus, it has been possible to detect the presence of pseudomonas fluorescence in the albumen of intact eggs by measuring the fluorescence excited by violet light.

The fluorescence measuring technique has many possible applications which have not been fully exploited.

Processing With Sonics

Ultrasonics is suffering from overpromotion and insufficient knowledge, according to Quentin McKenna, research physicist, Hughes Aircraft Co. He said additional research was necessary before high frequency waves can be used in the preparation of foods on a broad economical basis.

Discussing applications that have been suggested in food processing, he mentioned the effect of cavitation on cellular matter. It has been found that ultrasonic energy can be used to destroy bacteria, which suggests the possibility of sterilizing foods with it. Required exposure time is long, however, and if insufficient energy is used, some bacteria will multiply faster in a sound field.

Citing an investigation with chocolate syrup, it was found that, at cavitation level, ultrasonic vibrations actually increased growth of thermophilic spores. Chocolate milk made from the irradiated syrup showed bacterial counts, after pasteurization, five times as high as the controls.

Another disadvantage of ultrasonic

sterilization is that solid matter other than bacteria is also crushed. The mixture is actually homogenized. This rules out many food applications.

A more encouraging field is extraction of flavor-bearing substances. In Germany it is used to extract bitter substances from hops in the brewing process. One installation uses a 500w. generator at a frequency of 1,000,000 cycles per sec. to treat 12,000 gal. batches for 1 hr. Result is a 40% more efficient extraction, giving a substantial saving in hops.

In extracting vanilla flavor from the beans, a boiling temperature is often used. But it results in the loss of aromatic substances, and reduction in flavor. Extraction at low temperatures is a slow and inefficient process.

Ultrasonics allows extraction without loss of aromatics. This is achieved by cavitation—the formation and violent collapse of various pockets. Much research remains to be done on this process, particularly in flavor analysis. Ultrasonic energy has a tendency to oxidize substances and, if appreciable, might alter the flavor.

A field which has been recognized as a potential application is the process of homogenization. Successful homogenization of milk has been accomplished using frequencies in the vicinity of 1,000,000 cycles per sec.

To properly evaluate the process, however, it must be compared to the heat and pressure techniques in use today. A cursory analysis shows that ultrasonics is several times more expensive than the heat and pressure method. In addition, the milk must be pasteurized after treatment.

Instrumentation In Chemical Plant

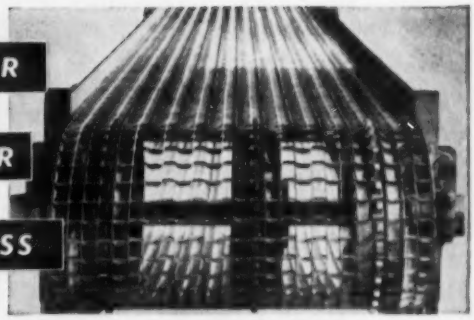
Stressing use of automatic quality testing devices in his company's plants in Wilmington, V. H. Hanson, E. I. du Pont de Nemours & Co., called on the food industry to investigate the possibility of using such instruments.

Our company, he said, uses colorimeters capable of expressing color coordinates in numbers and of detecting color differences the eye cannot discern.

There are advantages of automatic control analysis on a continuous-flow basis which keeps pace with production. Such methods permit quality control without an interruption of production.

Large economic losses can be avoided by employing modern instrumentation to determine the quality of raw materials, intermediates, and final products.

End (Resume reading on page 60)



LA PORTE

FLEXIBLE STEEL CONVEYOR BELTING

You are ready for any food process when you install this rugged La Porte Belting. It speeds up every food handling operation from loading bin to shipping dock. It resists loading impacts and provides a perfectly flat surface for containers, empty or filled.

The durable, open mesh, flexible steel construction permits circulation of air and liquids around products in process and facilitates cleaning with steam gun or scalding water. Resistant to heat and cold. Available in any length and practically any width.

LA PORTE MAT AND MFG. CO.

Write TODAY for illustrated literature, prices.

BOX 124 — *La Porte, Indiana*

QUICK CLEAN-UP WITH METSO

Metso Cleaner is geared to fast methods. Use Metso in steam gun cleaning. Dissolves quickly, removing oil, grease and proteins. Special component also controls corrosive effect of alkali on metals.

Get free copy—"Cleaning in Food Industries".

METSO CLEANERS

PHILADELPHIA QUARTZ COMPANY
1148 Public Ledger Bldg.
Philadelphia 6, Pa.

FOR THE LOVE O'MIKE

DREHMANN Joint filler

Harder, denser, corrosion resistant. For longer floor life be sure to specify Drehmann. Write for bulletin JE.

DREHMANN PAVING & FLOORING CO.
Originator of Brick Floors • Est. 1869
Gaul & Tioga Streets, Philadelphia 34, Pa.
507 Fifth Ave., New York 17, N. Y.

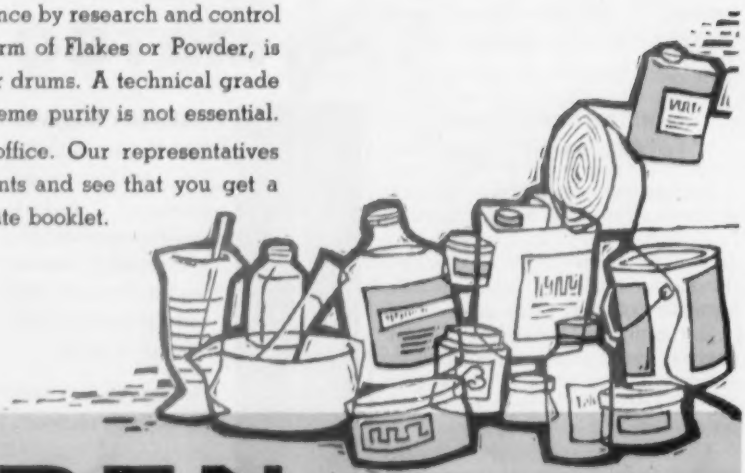
Protect the high quality of your product

with Heyden SODIUM BENZOATE

Since all foods and beverages may contain bacteria or molds in varying amounts, a threat to the quality and reputation of your product is always present. To protect flavor, freshness, appearance and taste, Heyden Sodium Benzoate can be used as a safe, effective preservative. It's economical insurance; just 1/10 of 1% will help keep margarine, soft drinks, jellies, juices, condiments and other products from spoiling.

Heyden—a long established producer of Sodium Benzoate—maintains highest purity and uniformity through modern specially designed equipment and close surveillance by research and control chemists. The U.S.P. Grade, in the form of Flakes or Powder, is available in 100, 50 and 25 pound fiber drums. A technical grade is supplied for applications where extreme purity is not essential.

Contact the nearest Heyden sales office. Our representatives will be glad to discuss your requirements and see that you get a copy of our informative Sodium Benzoate booklet.



HEYDEN
CHEMICAL CORPORATION
342 Madison Avenue, New York 17, N.Y.
CHICAGO • CINCINNATI • DETROIT • PHILADELPHIA • PROVIDENCE • SAN FRANCISCO

FINE HEYDEN CHEMICALS

Benzaldehyde • Benzoic Acids • Benzyl Chloride • Beta-Oxynaphthoic Acid • Chlorotoluenes • Creosotes • Formaldehyde • Formic Acid • Guaiacols
Parahydroxybenzoates • Pentaerythritols • Propyl Gallate • Resorcinol • Salicylates • Salicylic Acid • Sodium Benzoate • Sodium Formate

Recent Inventions

PRODUCTS

Edible Ice Cream Container Consisting Substantially of Pure Dextran—H. A. Toulmin, Jr., to Commonwealth Engineering Co. of Ohio, Dayton. No. 2,731,349. Jan. 17, 1956.

Pie Dough by Creaming Flour, Salt, and Sugar With High-Ratio Shortening, Mixing, Adding Water, Mixing Until Water Is Absorbed—E. A. Busch, Sturgeon Bay, Wis. No. 2,731,350. Jan. 17, 1956.

Soup Concentrate Comprising Sugar, Salt, Cooked Vegetables, Uncooked Vegetable Powder—M. M. Scharf, Green Bay, Wis., to B. Greenblatt, Chicago. Nos. 2,731,351-52. Jan. 17, 1956.

Antifungal Composition Employing Salicylanilide and Halogen Derivatives Thereof—L. Reiner, Essex Falls, to Wallace & Tiernan Co., Belleville, N. J. No. 2,731,386. Jan. 17, 1956.

Stable Vitamin Mixture Consisting of Folic Acid, B-Complex Vitamins, Water, Antioxidants—R. P. Tansey, Newark, and G. H. Schneller, Basking Ridge, N. J. to American Cyanamid Co., New York City. No. 2,731,390. Jan. 17, 1956.

Want more information on any of these recent patents — if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

Quick-Cooking Rice by Mechanically Compressing Whole Grains to Modify Their Structure Without Flaking—A. K. Ozai-Durrani, Stuttgart, Ark. No. 2,733,147. Jan. 31, 1956.

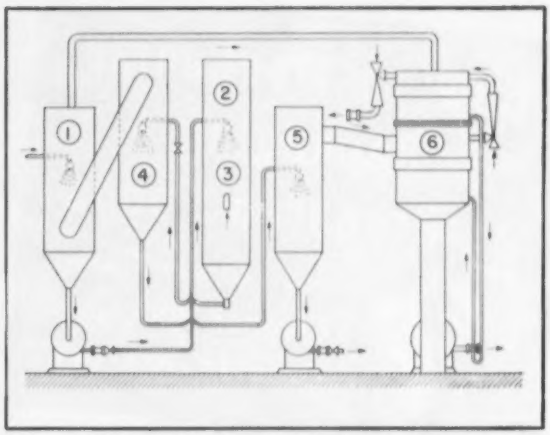
EQUIPMENT

Casing Fastener With Die Cavity, Cutting Edge, Vertically Reciprocating Punch, Crimping Means—M. J. G. Tipper, Oakland, Calif. No. 2,729,263. Jan. 3, 1956.

Automatic Liquid Feeder Consisting of Tank, Vertical Wheel, Bucket, Tray—L. & D. L. Fettkether, Farley, Iowa. No. 2,729,365. Jan. 3, 1956.

Spring-Controlled Lid for Popcorn Kettle—S. M. Waas to Manley, Inc., Kansas City, Mo. No. 2,729,416. Jan. 3, 1956.

Meat-Loaf Molder Including Casing, Overlying Closure Plate With Axially Aligned



Liquids Pasteurized by Direct Steam Injection, Expansion Units Preheat Feed, Cool Product

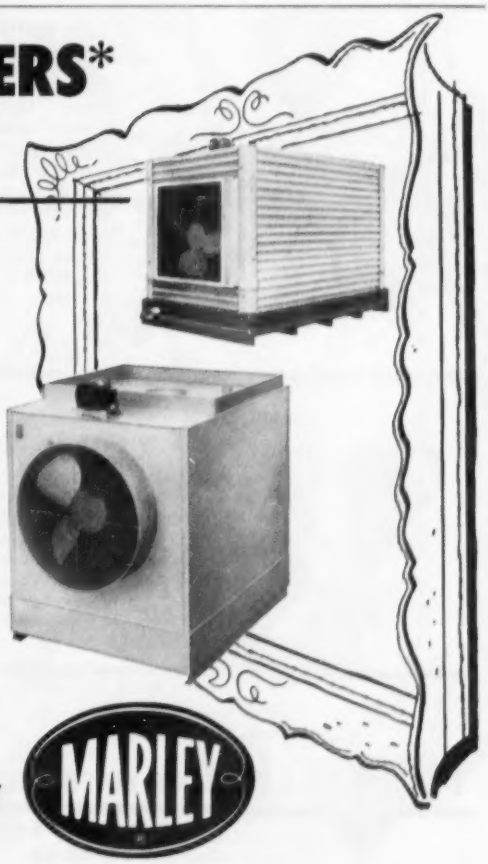
Incoming material at about 15C. is atomized in chamber (1), preheated to about 45C., then pumped to pasteurizer (2). Live-steam distributor (3) sterilizes the liquid, which is next drawn into intermediate expansion chamber (4). It flashes to about 50C. as released steam goes to preheater. Product, further cooled to about 30C. in expansion unit (5), is discharged by pump. Vacuum is provided by two-stage ejector (6).—*P. R. Laguilharre, Enghien-les-Bains, France. No. 2,732,308. Jan. 24, 1956.*

How Marley AQUATOWERS* *improve your profit picture...*

The efficiency — and the cost — of your air conditioning or refrigeration system depends to a great degree on the efficiency of your water cooling tower. That's why experienced operators everywhere select Marley Aquatowers for every cooling requirement. Any cooling problem you may have concerning capacity, service conditions, or tower appearance has been pre-solved in the complete Aquatower line. No need to overbuy or overload — Marley offers Aquatowers in 11 different sizes.

Right down the '56 Aquatower line, extra protection and longer service life are built-in features. All steel models are protected by MarClad — a rugged new finish of inert, baked plastic. Forced draft wood models, by the very nature of their design and component materials, represent the ultimate in corrosion-resistant cooling towers.

With local stocks in more than 300 cities, Marley packaged cooling towers are a sound investment that is always readily available. Remember, too, that just as the Aquatower line blankets the field of small-capacity cooling, larger Marley towers cover the water cooling front for intermediate and large capacities.



The Marley Company

*Trademark Reg.

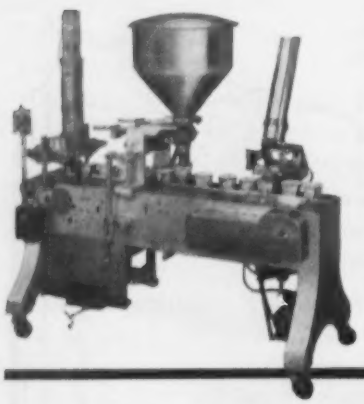
Kansas City, Missouri

How to Mechanize Packaging of Prepared Foods

for: Lower Costs
Cleaner Packages
Greater Accuracy

Chili • Potato Salad • Pie Fillings • Whipped Butter • Cottage Cheese • Liquid Caramel • Process Cheese • Gelatin Salads • Cole Slaw . . . or *what is your product?*

YOU CAN package nearly any semi-solid, semi-liquid or viscous food product up to 10 times faster with Triangle machines than by hand methods. Packages are clean. Weights are accurate (no check-weighing necessary). Filling is from the bottom up to eliminate air pockets. No fuss . . . no muss . . . less labor . . . and far lower costs!



FULL AUTOMATIC MODEL DS-1

Automatically dispenses, accurately fills and tightly caps paper, plastic or glass containers at speeds up to 35 per minute with one operator. Twin-line model available for 70 per minute production.

LOW COST TABLE MODEL

This machine accurately fills up to 19 packages per minute with one operator. An all steel work table and hand-operated disc lid capper are optional.

Write today for our New Bulletin No. DS-1

TRIANGLE PACKAGE MACHINERY CO.

6637 W. Diversey Avenue
Chicago 35, Illinois

Opening, Screw, Air Valve, Apertured Front Plate—V. L. Cheney, San Leandro, to Chip Steak Co., Oakland, Calif. No. 2,729,947. Jan. 10, 1956.

Cutting, Removing Device for Bunches of Dough Strings—M. and G. Braibanti, Milan, Italy. No. 2,730,050. Jan. 10.

Meat-Compressing Unit Having Elongated Base, Pivoted Cylindrical Trough, Compression Plate, Hopper, Air Cylinder, Piston, Plunger—J. Opie, Riverside, Ill. No. 2,730,286. Jan. 10, 1956.

Electric Can Counter Employing Directionally Responsive Sensing Means, Count Controlling and Suppressing Devices—B. D. Beamish, New Rochelle, N. Y. No. 2,730,-301. Jan. 10, 1956.

Sausage-Casing Remover Employing Tube, Annular Securing Means, Inlet for Fluid Under Pressure—R. A. Schneider, Bridgeport, Conn. No. 2,730,-754. Jan. 17, 1956.

Beef Dropper Comprising Roller-Mounted Frame Plate, Pivotally Supported Arm, Diverting Rail—O. Garapolo, W. J. Richter, and L. L. Campbell, Chicago, to Wilson & Co. No. 2,730,963. Jan. 17.

Machine for Orienting and Stemming Fruit With Stems—P. Wormser, San Francisco, and H. E. Metcalf, Los Angeles, to S & W Fine Foods, Inc., San Francisco. No. 2,731,-051. Jan. 17, 1956.

Decorticator for Hulling Humidified Grain Consisting of Vessel, Top Inlet, Bottom Outlet, Vertical Shaft, Rotor Elements, Radially Extending and Upwardly Inclined Arms, Baffles—E. Grimard, Liege, Belgium. No. 2,731,052. Jan. 17, 1956.

Fruit-Position Inspector and Segregator Having Rotary Member Positioned Above Carrier, Radial Fruit-Grasping and Indent-Sensing Means, Controls—E. W. Carroll, Redwood City, Calif., to S & W Fine Foods, Inc., San Francisco. No. 2,731,129. Jan. 17, 1956.

Egg Grader Including Scales, Conveyor, Carrier and Rotary-Annular Members, Transfer and Separating Means—G. A. Page, Detroit. No. 2,731,146. Jan. 17, 1956.

Centrifugal Employing Stationary Hollow Shell, Rotor, Axial Baffles, Inlet and Outlet Ducts—G. J. Strezynski to De Laval Separator Co., Poughkeepsie, N. Y. No. 2,731,331. Jan. 17, 1956.

Tendon Puller, Leg Severer Comprising Trough-Like Cavity, Convex-Faced Rotary Element, Power Means—S. B. Osborne, Medway, Mass. No. 2,731,664. Jan. 24, 1956.

Poultry Shackle With Support Element, Elongated Plate, Spaced Leg-Receiving Slots, Holding Member—R. S. Zebarth, Hickman Mills, to Gordon W. Johnson Co., Kansas City, Mo. No. 2,731,665. Jan. 24, 1956.

Vacuum Dehydrator Consisting of Evacuable Chamber, High-Vacuum Pumping Means, Conduits, Valves, Condenser—G. H. Bancroft to Consolidated Vacuum Corp., Rochester, N. Y. No. 2,731,734. Jan. 24, 1956.

Freezer-Door Frost Preventer Including Continuous Grooved Heating Element, Heat Bulb, Thermostatic Control, Cover Plate—J. V. Grubbs, Sr., Mobile, Ala. No. 2,731,804. Jan. 24, 1956.

Smoke Detector Having Outer Casing Defining Darkened Chamber, Air Outlet, Transparent Tubes, Inner Light-Proof Casing—C. C. Hall, Ealing, London, England, to Specialties Development Corp., Belleville, N. J. No. 2,731,874. Jan. 24, 1956.

Cereal Puffer Consisting of Rotating Turret With Treating Chambers, Movable Closures, Steam-Admitting and Synchronizing Means—F. C. Van Arsdell, Medina, and E. G. Gustavson, Stow, Ohio, to Quaker Oats Co., Chicago. No. 2,731,-904. Jan. 24, 1956.

Sliced-Fruit Processing Unit Employing Semi-Circular, Open-Tank Treating Bath, Rotor, Arms, Open-Basket Frames, Tripping Means—A. H. Morgan and G. A. Shuey, to University of Tennessee Research Corp., Knoxville. No. 2,731,-905. Jan. 24, 1956.

Shrimp Breader Comprising Feed Conveyor, Batter Bath, Horizontally Spaced Breading Hoppers, Breading Supply and Recirculating Means—R. T. Anderson, Brunswick, Ga., to Colter Corp., Palacio, Tex. No. 2,731,942. Jan. 24, 1956.

Premixing System for Carbonated Beverages—R. D. Hillis,

Columbus, Ohio to Nehi Corp., Columbus, Ga. No. 2,732,117. Jan. 24, 1956.

Poultry-Processing Unit Having Tank, Means for Conveying, Supporting, Leg Scalding — D. B. Van Dolah to Swift & Co., Chicago. No. 2,732,583. Jan. 31, 1956.

PROCESSES

Dehydrating White Potatoes by Mixing Cooked Mashed Spuds With Ethanol, Separating Liquid Phase, Recovering Dissolved Solids and Adding to Potatoes, Air Drying With Agitation—E. G. Heisler, Plymouth Meeting, Pa., to USA. No. 2,729,567. Jan. 3, 1956.

Refining Fatty Oils Continuously in Two-Stage Alkali Treatment by Using Steam From First Separation for Second Stage—I. A. Afzelius, Bromma, to Aktiebolaget Separator, Stockholm, Sweden. No. 2,729,662. Jan. 3, 1956.

Molding Bread Dough Continuously by Sheeting to Flat Elgonated Piece, Turning 90 deg., Curling, Turning 90 deg., Pressure Rolling—F. F. Hansen, Pittsburgh. No. 2,730,051. Jan. 10, 1956.

Pitting Fruit by Heating Only the Portion Adjacent Pit to Reduce Adhesion — J. G. Aguilar, Concord, and G. W. Brown, Berkeley, Calif. No. 2,730,149. Jan. 10, 1956.

Making High-Protein Food by Forming Protein Dispersion, Adding Modifying Agent, Adjusting pH, Extruding Into Coagulation Bath—R. A. Boyer, Cincinnati, and E. D. Saewert, Park Forest, Ill., to Swift & Co., Chicago. Nos. 2,730,447-448. Jan. 10, 1956.

Improving Lactose Crystallization in Concentraded Milk Products by Adding Water-Soluble Compound Plus Crystallized Lactose, Pulverizing.—T. R. de Vries to De Cooperatieve Fabriek Van Melkproducten Te Bedun, Netherlands. No. 2,730,449. Jan. 10, 1956.

Recovering Glutamic Acid From Partially Hydrolyzed Steffen's Filtrate by Concentrating to 55-80% Solids, Crystallizing, Separating.—F. A. Hoglan, Glenview, Ill., to International Minerals & Chemical Corp. No. 2,730,545. Jan. 10, 1956.

Concentrating Juice at Low Temperature by Preheating in Film-Type Unit Discharging to Vapor Separator, Separating Water Vapor, Recovering Concentrated Juice, Recirculating Portion of Concentrate Into Dilute-Juice Stream—J. E. Seeley, Long Beach, to E. A. Silzle Corp., Anaheim, Calif. No. 2,732,008. Jan. 24, 1956.

Stabilizing Malt Beverages With Solution Including Guaiaretic Acid and/or Derivatives Thereof, Water-Soluble Metabisulfate, Base That Forms Salt of Water-Soluble Antioxidant—A. S. Wahl, Chicago. No. 2,732,306. Jan. 24, 1956.

Blending Streams of Potato Granules to Uniform Moisture Content by Mixing Continuously in Fluidized Bed—G. H. Neel, Albany, and M. W. Cole, San Pablo, Calif., to USA. No. 2,732,307. Jan. 24.

PACKAGING

Hood-Capping Head Consisting of Annular Cap-Engaging and Contracting Fingers, Annular Pivots, Cam—I. L. Wilcox, Fulton, and N. S. Cole, Baldswinsville, to Oswego Falls Corp., Fulton, N. Y. No. 2,729,379. Jan. 3, 1956.

Bottle Caser, Uncaser With Feed Conveyor, Transfer Unit, Assembly Table, Crate Conveyor, Bottle Grippers, Pneumatic Means—A. G. Enock, Thame, to Graham-Enock Mfg. Co., Ltd., London, England. No. 2,730,279. Jan. 10, 1956.

Package Sealer Including Hollow Case With Separable Top and Bottom, Gasket, Electrodes, Vacuum Connections—J. J. Prohaska, La Grange, to Swift & Co., Chicago. No. 2,730,281. Jan. 10, 1956.

Pea, Bean Filler Comprising Revolving Liquid Tank, Apertured Measuring Pockets, Telescopic Adjusting Plugs With Air Vents, Spherical Rubber Balls Within Perforated Tubes, Stationary Cam Track—O. T. Hutchinson, Salem, N. J. No. 2,730,284. Jan. 10, 1956.

Bottle Carrier Having Flat Bottom, Vertical Sides, Upwardly Converging Top Walls With Elliptical Holes, Flanges —E. T. Wahlbom, Rockford, Ill., to O. E. Griggs, E. Hartford, Conn. No. 2,731,169. Jan. 17, 1956.

Container Filler Including Horizontal Tray, Pusher Member, Receiving Slab, Drive Means—A. L. Conrad, New Iberia, La. No. 2,732,112. Jan. 24, 1956.

. . . AND
Clinton's famous
for service, too
CLINTON HOUSE
Menu
FOR TODAY
LUNCHEON SUGGESTIONS
BIG SLICE OF SOUTHERN BAKED HAM*
garnished with pineapple* rings . . . whipped potatoes & gravy* . . . whole-grain corn* . . . fresh roll* & butter . . . coffee or tea
THICK CORNED BEEF* SANDWICH . . . choice of fruit cocktail*, salad* or cream of mushroom soup* . . . cherry pie* . . . coffee or tea
TWO FRESH EGGS AND BACON* STRIPS . . . toast* & jelly* . . . steaming coffee or tea
ASSORTED COLD CUTS* . . . french fries* . . . sweet pickle* slices . . . bread* & butter . . . coffee or tea
A LA CARTE
Cream-Style Corn* String Beans* Creamed Peas*
SALADS
Diced Fruits*
Tomato Slices on Lettuce
Fruit Gelatin*
Cottage Cheese on Peach*
DESSERTS
Choice of Fresh Pies*
Ice Cream*
Choice of Pudding*
Assorted Candies
BEVERAGES
Coffee — Tea — Milk — Bottled Beer*

* FOODS ENHANCED WITH CLINTON PRODUCTS FROM CORN:

Clinton® CORN STARCH
CORN SYRUP
REFINED CORN OIL

If you don't find what you want on the menu — just ask for it. From soup to dessert, Clinton products from corn have been serving packers, canners, bakers, candy makers, brewers and ice cream makers for years and years.

When a food processing problem calls for starches, syrups or dextrose . . . have Clinton give you a big serving of their technical service.

As a Clinton "regular" you'll join a clientele that includes some of the biggest food names in America. To insure promptness call on Clinton.

Quality products
FROM THE WORLD'S CORN CENTER

CLINTON

CLINTON FOODS INC.
Corn Processing Division
CLINTON IOWA

CLOTHING TO FOIL ACID AND OIL

Wear tough, comfortable clothing and boots made of Neoprene—coated outside *and* inside! Perfect for cannery, dairy and packing house workers. Fights off fats, oils, acids. Resists abrasion. Made to *last!*

U. S. NEOPRENE APRON
• Heavy duty • Fully vulcanized double-coated white or black neoprene • neck loop • hemmed edges • size 33" x 45"

us. Raynster®

U. S. PEERLESS NEOPRENE SUIT
• Neoprene coating outside and inside • full-length jacket • corduroy-tip collar • bib-front overalls • black, olive drab or safety yellow

U. S. BUTYLAC GRAY SHORT BOOT
• deep-cleated sole • resists fats, oils, acids

US ROYAL FOOTWEAR

NEOPRENE SHORT BOOT
• duck lined • "Shockproof" cushion sole • cleated sole and heel

Sold only through industrial and retail stores

U. S. INDUSTRIAL RAYNSTERS®
U. S. ROYAL RUBBER FOOTWEAR

US RUBBER **United States Rubber**

Men & Companies

Industry

Borden Co., New York City, has acquired **Clover Brand Dairies, Inc.**, High Point, N. C., and **Resin Industries**, Santa Barbara, Calif.

Campbell Soup Co. has received the Howard-Ford Award for outstanding achievement in sales management.

Cafe Listo Instant Coffee Plant, San Salvador, El Salvador, is now in full operation. It was established with half American, half Salvadoran capital.

Hunt Foods, Fullerton, Calif., has begun construction of a 225,000 sq. ft. warehouse in Fullerton.

Lake of the Woods Milling Co., Montreal, has acquired 96.66% of the outstanding common stock of **Inter City Baking Co.**

Langfield Co., Oakland, Calif., has completed a refrigerated warehouse in San Leandro, Calif.

Libby, McNeill & Libby, Chicago, will build a new 29,120 sq. ft. manufacturing plant in Ocala, Fla.

Monarch Packing Co., St. Louis, Mo., plans to construct a meat-packing plant at East St. Louis, Ill.

National Dairy Products Corp., New York, has announced that earnings in 1955 rose for the fourth successive year.

National Tea Co. and **George Weston, Ltd.** have held preliminary discussions looking toward a merger of the two firms.

Neptunalia Seafood Co. has announced plans for formation of a new $300,000 corporation with a plant in Savannah.

Paisley Products Inc., New York & Chicago, has announced the acquisition of **Woerz Paste & Gum Co.**, Los Angeles, Calif.

Pepsi-Cola International has opened its first bottling plant in India.

Clive C. Day has been elected chairman of the board of The Nestle Co., Inc., White Plains, N. Y.

Peter Paul, Inc., Chicago, plans to construct a candy plant at Frankfort, Ind. at estimated cost of $3,200,000.

Quaker Oats Co., has purchased **Richards Grain Co.**, Tampa, Fla.

Red Wing Co., Inc., Fredonia, N. Y. has acquired the assets of **American Preserve Co.**, Philadelphia.

Sealtest will build a milk bottling plant in Camden, N. J.

Rainbo Bread Co. will build a new $1 million bakery at Adams City, Colo.

Snac-N-Crust, Inc., Kalamazoo, Mich., has been incorporated by Garrett Troff for $10,000 to manufacture pastry mix.

Super Value Cookie Co., Detroit, has been incorporated by Arthur Ellis for $50,000 to manufacture cookies and pastries.

Standard Brands, Inc., New York, has completed purchase of **Corn Processing** and **American Partition** divisions of **Clinton Foods, Inc.**, along with $11,285,000 face value of 4% **Minute Maid Corp.** debentures held by Clinton. Initial purchase price was announced as approximately $59.5 million in cash.

Tee-Pak, Inc., Chicago, will build a multi-million dollar branch plant in Danville, Ill.

Treesweet Products Co., Inc., has announced plans to build a $1,400,000 orange juice

Colorful Packages Stand Out!

• • • and the right combination of colors on your frozen food wrapper can be the difference between making and losing sales. Color is one of three basic elements in modern package design. When properly compounded, these design factors give your frozen food package a "personality" that stands out in frozen food cabinets . . . *and sells!*

But modern package design is a science. To achieve a colorful frozen food package that sells on impulse against *all* competition requires highly specialized knowledge and experience. Call on Western Waxed Paper Division for this sales-proved package design service to boost sales of your frozen food products.

Increased Sales
. . . by Design!

CROWN ZELLERBACH CORPORATION • WESTERN WAXED PAPER DIVISION

SAN LEANDRO AND LOS ANGELES, CALIFORNIA; N. PORTLAND, OREGON

SALES SERVICE OFFICES: Chicago, Dallas, Denver, New York City, Salt Lake City, Seattle, Spokane

10019-B

Let's face it!

HAVE YOU A DISASTER PLAN FOR YOUR PLANT?

BOMBS...OR FIRE...OR FLOOD...OR TORNADO ...you can handle them if you act now.

Let's face it... the threat of war and the atomic bomb has become a real part of our life—and will be with us for years. Fires, tornadoes and other disasters, too, can strike without warning.

Whatever the emergency is, everybody's going to want help at the same time. It may be hours before outside help reaches you. The best chance of survival for you and your workers—and the fastest way to get back into production—is to know what to do and be ready to do it. Disaster may happen TOMORROW. Take these simple precautions TODAY:

☐ **Call your local** Civil Defense Director. He'll help you set up a plan for your offices and plant—a plan that's safer, because it's integrated with community Civil Defense action.

☐ **Check contents** and locations of first-aid kits. Be sure they're adequate and up to date. Here, again, your CD Director can help. He'll advise you on supplies needed for injuries due to blast, radiation, etc.

☐ **Encourage personnel** to attend Red Cross First-Aid Training Courses. They may save your life.

☐ **Encourage your staff** and your community to have their homes prepared. Run ads in your plant paper, in local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads and official CD films or literature that you can sponsor locally. Set the standard of preparedness in your plant city. There's no better way of building prestige and good community relations—and no greater way of helping America.

Act now . . . check off these four simple points . . . before it's too late.

concentrate plant near Fort Pierce, Fla.

Westfield Planters Co-operative, Inc. and **Westfield Food Products, Inc.**, of Westfield, N. Y. have merged.

Wickes Corp.'s Mich. Bean Div., Saginaw, Mich., has announced a $700,000 expansion program involving additions to storage and handling facilities.

Personnel

E. J. Abeling and **O. H. Miller** have been named assoc. directors of research for Beech-Nut Packing Co., Canajoharie, N. Y.

August A. Busch, Jr. has been elected chairman of the board of Anheuser-Busch, Inc. succeeding **Eberhard Anheuser** who has resigned.

Hal Chase has been named vice-president and director of marketing for Hawaiian Pineapple Co.

Charles Ferrari, technical director, has been elected vice-president of J. R. Short Milling Co., Chicago.

Lawrence L. Frank has been named board chairman of Van de Kamp's Holland Dutch Bakers, Inc., and **Edward Mills** made president.

Robert Garver has been appointed product manager for poultry and pies for Birds Eye div. of General Foods.

B. Barret Griffith and **Dennis Orourke** have been elected directors of Holly Sugar Corp., Colorado Springs, Colo.

Dr. C. L. Hankinson has been appointed assoc. professor in the dept of dairy Technology, Ohio State Univ.

Allen H. Schultz has been elected president and board chairman of Canadian Ace Brewing Co., Chicago.

George Jeppsson, former president of Swedish canning firm "Esseli", has joined Good Foods, Inc., Culver City, Calif., as plant production manager.

C. G. Harrel has been appointed head of New Product Idea Dept. of Pillsbury Mills, Inc., Minneapolis, and **Mary Kimball** named as his associate.

J. Walter Herbert has been elected president of Cherry Growers & Industries Foundation.

Dr. Sam R. Hoover, assist. chief of USDA's eastern Utilization Research Branch, Philadelphia, has received the $1,000 Borden Award in Chemistry of Milk.

Leroy Hughes has been appointed president and general manager of Franklin Foods, Inc., Ann Arbor, Mich.

Benjamin Johnson has been elected president of SeaPak Corp., **W. F. Cummings,** general manager, and **J. Roy Duggan** v.-p.

Bertel Jonson has been named assist. to the treasurer of Hunt Foods, Inc.

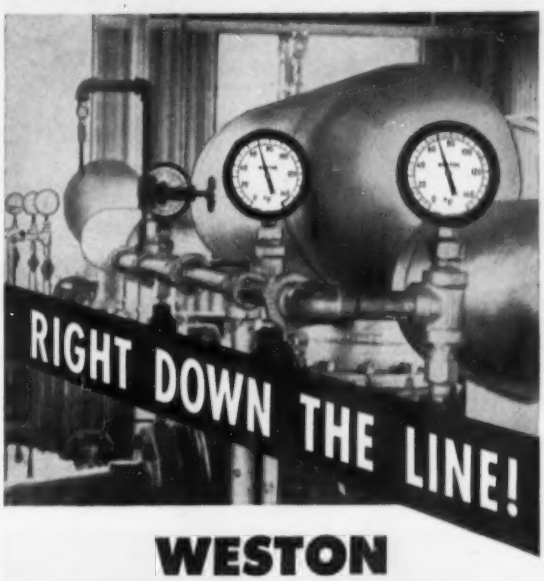
W. Grant McKnight has been appointed v.-p. and comptroller of Shirriff-Horsey Corp., Ltd., Plant City, Fla. and Toronto, Canada.

Norman Merrill, general manager of Blue Lake Packers, was elected first president of newly formed Northwest Canners & Freezers Assn.

Marshall S. Lachner has been elected president of Hoffmann Beverage Co. and **Harris Perlstein** named board chairman.

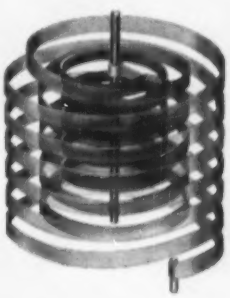
Dr. Gerald Reed has been appointed director of research

DEPENDABILITY



WESTON THERMOMETERS

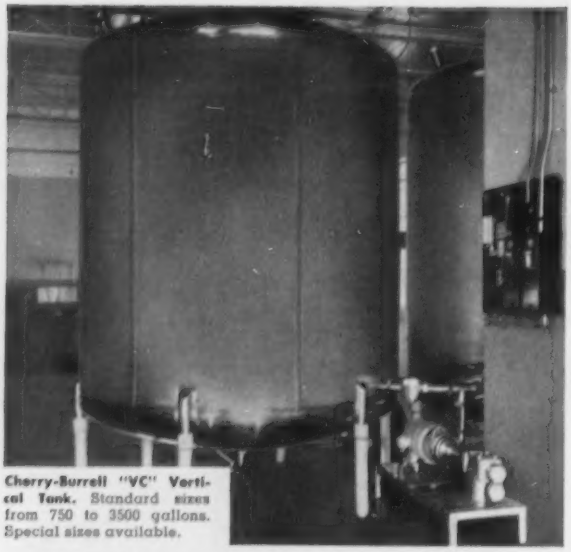
with Multiple bimetal helix



The reasons why WESTON all-metal industrial thermometers excel in dependability and long life... enjoy such outstanding preference throughout industry... stem in large part from Weston's exclusive design and manufacturing methods. The critical *sensing elements* are all Weston-made in the shorter *multiple helix* form to insure rugged, *nonsagging* units. They are then *cycle-seasoned,* over broad temperature ranges, to insure *consistently precise indications* over far longer periods. Thus they serve better, longer, at far lower over-all costs. Bulletin containing sizes, ranges and prices, available on request. WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, N. J.

WESTON *Thermometers*
AVAILABLE THROUGH LEADING DISTRIBUTORS

For more data, circle this page number on card at back →



Cherry-Burrell "VC" Vertical Tank. Standard sizes from 750 to 3500 gallons. Special sizes available.

Which stainless steel tank

Cherry-Burrell "HC" Horizontal Tank. Standard sizes from 1000 to 5000 gallons. Special sizes available.

should you put in your plant?

Your plant layout may determine which Cherry-Burrell Tank best fits your needs. It's just a question of space since both tanks store, mix, heat and cool a variety of products.

Both models feature all-welded 18-8 stainless steel, No. 4 inside finish with welds ground smooth; bright finish outside, with welds wire brushed.

Both models can be provided with agitators to do your job. Vertical tanks offer choice of standard dish or reverse dish bottom for easy drain.

Accessories include built-in germicidal lamps, sanitary gauge glasses, thermostats, auto-level controllers, channel wall surface for heating and cooling.

For further information, see your Cherry-Burrell Representative, or write for Bulletin G-506.

CHERRY-BURRELL CORPORATION

427 W. Randolph Street, Chicago 6, Ill.

Dairy • Food • Farm • Beverage • Brewing • Chemical • Equipment and Supplies

SALES AND SERVICE IN 58 CITIES — U. S. AND CANADA

John Mooney has been appointed vice-president in charge of sales and advertising for Oriental Foods, Inc., Los Angeles.

---

of Red Star Yeast & Products Co., Milwaukee.

Faris Russell has been named president of Ward Baking Co. and will also retain his position as board chairman.

Dr. Edward Weidlein has retired as president of the Mellon Instit. of Industrial Research, Pittsburgh, Penna.

John Whittaker has been elected president of New England Confectionery Co., Cambridge, Mass.

Associated Industries

Arkell & Smiths, New York City, has appointed Frederick Kiendl assist. manager of its **Flexible Packaging Div.**

Arabol Mfg. Co., New York City, has announced the purchase of current formulas for manufacture of resin emulsion adhesives from **Dewey & Almy Chemical Co., Div. of W. R. Grace & Co.**

Beckman Instruments, Inc. has begun construction of a new plant in Munich, Germany, scheduled for completion in late October.

Dole Refrigerating Co., Chicago, has appointed W. E. Lauterbach chief engineer.

Dave Fischbein Co. has completed its new plant in Minneapolis.

Hayssen Mfg. Co., Sheyboygan, Wis., has opened a new sales office in New York City.

Hyster Co., Portland, Ore., will construct a new plant in Danville, Ill.

International Paper Co., New York City, has named John Hinman board chairman.

Kaiser Aluminum & Chemical Corp. has formed a new division, **Foil Kraft Div.,** to manufacture and sell aluminum food containers.

National Can Corp. has elected Robert Solinsky president.

National Wooden Box Assn. has added Thomas Luddy, former packaging technologist with U. S. Navy Dept., to its staff.

N. Amer. Philips Co., Inc.'s Instrument Div. will sponsor two X-ray diffraction schools during coming months.

Paterson Parchment Paper Co., Bristol, Penna., has elected E. R. Leonhard president.

Permutit Co. has elected President Henry Foulds as chairman of its board.

Reigel Paper Corp., New York City, has appointed John Wright and Roscoe Ingalls to its board of directors.

Shulton, Inc., New York City, is offering the 220,000 shares of common stock to the public. Previously all stock was privately held.

Southern Can Corp., will build a new can manufacturing plant in Birmingham, Ala. expected to be started this summer.

Spencer Kellogg Research Center has been opened in Buffalo, N. Y. under the direction of Dr. Malcolm Renfrew.

Deaths

Arthur Bowron, 73, president of Bowron Products, Hamilton, Ontario.—March 16.

Fred Dow, 74, former owner and treasurer of F. H. Dow Co.—March 20.

Alfred Halden, 61, executive vice-president and director of National Starch Products Inc.

Frederick Leonhardt, 83, board chairman of Fritzsche Bros., Inc. and its affiliate Dodge & Olcott, Inc.—April 10.

Carl Pletscher, 76, retired vice-president and general manager of Baker Perkins, Inc.—April 4.

"I'm burning these ten-spots," said Hodge,
Burning bills in his big truck garage,
"To show how we lose,
When a new truck we choose,
Without first having checked on Dodge!"

QUICK QUIZ FOR TRUCK BUYERS

Try this quick quiz before you buy your next truck—and you'll get a better truck for your money:

Q. **What truck line offers you *today's lowest prices* on such popular models as the ½-ton panel, the 1-ton express, and the 1½- and 2-ton stakes?**

Q. **Which truck line has the largest cabs?**

Q. **Which has the greatest driver visibility?**

Q. **Which has the shortest turning radius?**

The answer is "Dodge"—leader for the last 39 years. And this year "Dodge" is the answer to virtually every question you can ask that has to do with lower cost haulage or delivery.

You'll find Dodge trucks are the best answer, too, on price. For Dodge trucks are priced so competitively that no one can beat your Dodge dealer's deal.

When time comes to buy your next truck—get the answers that will lead you straight to today's best truck value—Dodge.

DODGE
Job Rated
TRUCKS
WITH THE *FORWARD* LOOK

Get the Dodge Dealer's Deal Before You Decide

Help for the conscientious

We make Myverol® Distilled Monoglycerides, *Type 18-06*, for the man who has an "all-vegetable" label to live with. We make it so that he need not deny his product those wonderful texture effects obtainable with *Type 18-00* in shortening, baked goods, margarine, icing, and frozen desserts just because the tiny amount of it he would need is made from hydrogenated lard.

Type 18-06 gives him a flake-type genuine *Myverol* monoglyceride, with all the advantage it means in economy, purity, and effectiveness—but made from hydrogenated vegetable oil and U. S. P. Standard glycerine. The only preservative is a trace of citric acid, which confers excellent stability.

Distribution of fatty acid chain lengths is not exactly the same in *Type 18-06* as in *Type 18-00*, the *18-00* tending to run a trifle lower in saponification number. Iodine value of *18-06* is a trifle higher. Both congeal at about 68 C. Both contain no less than 90% active mono, not counting 2-monoglycerides, which are active too.

Despite the close similarity, it is advisable to run some experiments on your products with *18-06*, even if you are already very familiar with *18-00*. If you're not, it's even more advisable.

For generous samples and helpful advice, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies and Company, Los Angeles, Portland, and San Francisco • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries
is a division of **Eastman Kodak Company**

Just Off the Press

New Catalogs and Bulletins
—Free for the Asking—

PLANT ENGINEERING

Compressor Line

Illustrations show applications of a wide line of centrifugal and reciprocating compressors — with electric, steam, gas and diesel power—for handling a variety of gases at pressures up to 35,000 psi. Form 3132-A, 8p.—*Ingersoll-Rand, New York City. (218A)*

Vacuum Pumps

Details operation of a series of vertical, centrifugal-type condensate and vacuum pumps. Diagrams show installation and operating principles, charts list dimensions and other selection data. Bulletin 1465, 28p.—*Sarco Co., Inc., New York City. (218B)*

Strainers, Air Eliminators

Bulletin features series of in-line and angle strainers and air elimination devices. Cutaway drawings illustrate construction. Installation diagrams are included. Bulletin OG-326, 8p.—*Rockwell Mfg. Co., Pittsburgh. (218C)*

Plastic Laminate

Leaflet presents some applications of an acid- and alkali-resistant plastic lamination. Material is composed of plastics that are fused to a glass fiber backing. Conventional adhesive is used to apply product to tanks, pipes, drums, conveyor belts and other process equipment. 2p.—*Garlock Packing Co., Palmyra, N. Y. (218D)*

Versatile Speed Reducers

Pictures a unique speed reducing device that will deliver infinitely variable speeds from 0 to full rpm. Unit is available with a reverse feature, having a full range on either side of zero. 12p.—*Revco, Inc., Minneapolis. (218E)*

Heat Exchangers

Reveals design improvements in a heat exchanger, made in single and two-pass models. Tables offer selection facts. Bulletin Supplement 12-HS, 2p.—*Schutte & Koerting Co., Cornwells Heights, Pa. (218F)*

Machinery Directory

Bulletin gives alphabetical listing of literature on company's products. Covers wide line of machines in process, materials handling, and electrical fields. Bulletin B6057, 24p.—*Allis-Chalmers Mfg. Co., Milwaukee. (218G)*

Miniature Components

Presents an interesting discussion of miniaturization in machine parts. Mathematical data given to support design applications. Discusses metals for miniature parts. 22p.—*Standard Pressed Steel Co., Jenkintown, Pa. (218H)*

Grease Collector

Shows construction of an automatic collector for grease and oil. Drawings and diagrams show operation of the unit, said to eliminate grease clogged pipelines. 4p. —*Josam Mfg. Co., Michigan City, Ind. (218I)*

Air Pumps

Series of blueprint drawings depict application of compressed air and vacuums, derived from a rotary air pump, to specific operations. General principles seem applicable over a wide range of food industry processes. Bulletin 9755, 26p.—*Leiman Bros., Inc., Newark, N. J. (218J)*

Prefab Stack

Tells all about an insulated, refractory stack for industrial application. Prefabricated sections are available in six diameters from 10 to 24 in. I.D. Bulletin IP-18, 4p. —*Van-Packard Corp., Bettendorf, Iowa. (218K)*

Free Literature—Fast Way

Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard — back of book. Then sign at the bottom and mail.

For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

Solvent Recovery

Technical bulletin covers theory of a carbon adsorption system for recovery of process solvents from air. Discusses circumstances in which such systems give economy, safety, pollution elimination, or other advantages. Bulletin W-356, 6p.—*Barnebey-Cheney Co., Columbus, Ohio. (218L)*

Water Treatment

Technical bulletin discusses several systems for removal of iron and manganese compounds from municipal and industrial water supplies. Fully illustrated with diagrams. Technical Reprint T-144, 8p.—*Graver Water Conditioning Co., New York City. (218M)*

LITTLE GIANT FOOD CONVEYOR BELTS

The right color means easy picking–

food inspection is more efficient with these colorful "U.S." belts

More and more, the food processing industries recognize the value of conveyor belts whose color allows rejectable items to be easily spotted during sorting and inspection. With new U.S. Little Giant food conveyor belts—in color—imperfect food or packaging "pops out" to the eye, makes inspection easier and quicker. Workers' eye-strain and eye-fatigue are lessened; plant morale and appearance are given a lift.

These colorful belts are resistant to food oils, acids and greases, to alkaline detergents and to moisture. They stay flexible over a wide range of temperatures. They are non-porous, odorless, non-contaminating and easily cleaned.

There's a complete line of belting for any conveyor need—plus factory-trained engineers to service you—at all 28 "U.S." District Sales Offices. Or write Mechanical Goods Division, United States Rubber, Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

New possibilities for continuous processing!

...with Foxboro sanitary proportional flow control

Foxboro Magnetic Flow Meter . . . transmits flow measurement to recorders or controllers.

You no longer have to discard new ideas in continuous process design for want of adequate flow control! Foxboro now provides the first complete sanitary proportional flow control system ever available.

Heart of this system is the Foxboro Magnetic Flow Meter. It has proved highly successful in measurement of widely varied food products including beer, tomato products, apple juice, and grape juice. And it's equally applicable to many others, such as egg yolks, wine—even molasses! It measures *magnetically*, with no flow interference, no pockets, crevices, or projections to collect residue or contamination. And its high accuracy is sustained, despite variations in conductivity, density, and viscosity.

The Dynalog Controller and the Saniflo Valve complete the system . . . offer a complete sanitary control "package". Send us your flow control problem. Write **The Foxboro Company, 305 Neponset Ave., Foxboro, Mass., U.S.A.**

A complete, sanitary proportional flow control package

Foxboro Magnetic Flow Meter. Accurately measures the flow of virtually any liquid except non-conductors like chocolate, fats and oils. Installs easily in the line like any equivalent length of pipe. No taps, seals, purges, meter runs, or straightening vanes required. Connects by 2-conductor cable to remote Dynalog Controller.

Foxboro Dynalog Recording Controller. Responds instantly to changes in volume flow, initiates fast, accurate valve action to hold pre-set rate. Troublefree, stepless measuring circuit has no slidewire — requires no standardizing or batteries, practically no maintenance. Control action can be air-operated or electric-operated.

Foxboro 2-way Saniflo Control Valve. A streamlined valve for liquids, suspensions, viscous or pulpy materials. Equally effective for throttling (proportional) or open-and-shut control. One-piece stem and plunger — no threads or crevices to harbor bacteria. Quick-disconnect clamp for easy cleaning. Can be replaced in control system by other type valve or a pump to meet process requirements.

FOXBORO
REG. U.S. PAT. OFF.

SANITARY FLOW CONTROL

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

Miniature Couplings

Leaflet tells of some advantages for a tiny coupling designed for electronic drives and other miniature applications. Rated speed: 50,000 rpm. 1p.—*Thomas Flexible Coupling Co., Warren, Pa. (221A)*

Floor Drains

Gives full facts on a new floor drain with non-clogging features. Illustration shows styles, drawings and tables give dimensions. 8p.—*Josam Mfg. Co., Michigan City, Ind. (221B)*

Fire Pumps

Comprehensive catalog presents full facts on a line of horizontal, centrifugal fire pumps. Pictures gas and electric powered models and details pump construction and specifications. Bulletin B-1500, 34p.—*Food Machinery & Chemical Corp., Peerless Pump Div., Los Angeles. (221C)*

Compact Chemical Pumps

Considers a combination motor-centrifugal pump for handling corrosive fluids. Seal-less unit is fabricated from various types of stainless steel and is available with plastic pump chambers. Bulletin 1030, 4p.—*Chempump Corp., Philadelphia. (221D)*

Refrigeration Compressors

Treats of ammonia and freon booster systems for low temperature refrigeration. Compressor types are illustrated, cutaway drawing shows construction details. Bulletin 516-E, 18p.—*Frick Co., Waynesboro, Pa. (221E)*

Incinerator Standards

Concerns standards, classifications, and specifications for incinerator design. Details seven different types of units. 7p.—*Incinerator Institute of America, New York City. (221F)*

Exhaust Blower

Concerns compact exhaust fan for small areas such as washrooms, storage rooms, and corridors. Available in 29 basic models. Form 304, 2p.—*Swartwout Co., Cleveland. (221G)*

Ball-Type Valves

Covers operating advantages of a ball-type cock valve, made in aluminum, bronze, stainless steel, carbon steel, and various plastics. Units available in sizes from ¼ to 2 in. 4p.—*Jamesbury Corp., Worcester, Mass. (221H)*

Milk Meters

Describes a rotary-piston milk meter for dairy applications. Unit is fully sanitary and quickly disassembled. Large scale shows gallonage. 6p.—*Chicago Stainless Equipment Corp., Chicago. (221I)*

Y-Type Pipe Strainers

Details are given for a line of steel pipe strainers for steam, water, gas, air, and oil line application. Stainless steel screen is standard on unit. Bulletin 602, 2p.—*Armstrong Machine Works, Three Rivers, Mich. (221J)*

Vacuum-Air Pumps

Concerns operation of a series of positive-displacement vacuum pumps. Units are used to give smooth air flow in either suction or pressure applications. Models available with capacities from 0.8 to 162 cfm, and pressures to 20 lb., vacuum to 29.9 in. Catalog 755, 12p.—*Leiman Bros., Inc., Newark, N. J. (221K)*

Speed Control

Considers engineering and selection data for a line of infinitely-variable speed control units. Drawings show construction. Catalog 65, 25p.—*Lewellen Mfg. Co., Columbus, Ind. (221L)*

MAINTENANCE

Tube Cutter

Leaflet illustrates advantages of a compact cutting tool, handling tubing from ⅛ to 1 in. O.D. Cutter is equipped with a retractable reamer and spare cutting wheel. Bulletin 3053, 1p.—*Imperial Brass Mfg. Co., Chicago. (221M)*

Solid Film Lubricants

Bulletin shows how solid film lubricants cut machine part wear. Various other advantages listed. 8p.—*Electrofilm Inc., Hollywood, Calif. (221N)*

Dimension Gage

Details features of an electric instrument for gaging external dimensions of irregular-shaped parts. Numerous photos show operation and accessories. Bulletin 200, 4p.—*Metron Instrument Co., Denver. (221O)*

Storage Equipment

Booklet lists line of lockers, storage cabinets, steel shelving, work benches, and office furniture for industrial use. 24p.—*Precision Equipment Co., Chicago. (221P)*

Relay Maintenance

Describes test equipment, necessary records, and standard procedure used to test protective relay equipment. Preventive maintenance is detailed in tables and schematic drawings. Data Sheet 156 UB, 4p.—*Multi-Amp Corp., Newark, N. J. (221Q)*

Test Instruments

Gives facts on a series of meters for measurement of temperature, volts, amps, and watts. Units are applicable to refrigeration, air conditioning, and heating equipment. 4p.—*Simpson Electric Co., Chicago. (221R)*

DOWNYFLAKE
4-Star SERVICE
helps you choose the best BREADER

To help you make more money with breaded frozen foods —to turn out a better product at lower cost: That's the goal of Downyflake 4-Star Service.

Downyflake's unique team works with you in every phase of operation. . Gives you combined know-how, facilities and resources no other organization can offer you:

★ RESEARCH

★ BREADER and BATTER MIX

★ LOW PROCESSING LABOR COST

★ FIELD TECHNICIANS

★ **RESEARCH:** DCA food laboratories — one of America's best — conducts constant research to help develop a breader mix that meets your needs for better taste, pick-up, color, absorption; prevention of blistering, etc.

★ **BREADER and BATTER MIX:** Our over 37 years of mix processing leadership guarantees you dependable uniformity and top quality on both products.

★ **LOW PROCESSING LABOR COST:** We offer you the most complete line of automatic equipment for dipping, breading, frying, cooling, etc., which we design and manufacture.

★ **FIELD TECHNICIANS:** Practical men, trained in the use of breader mix and automatic equipment, work with you constantly in your own plant, backing up our guarantee of top performance.

"to the Kings Taste"

Doughnut Corporation of America
BREADER & PROCESSOR DIVISION
45 WEST 36th STREET · NEW YORK 18, N. Y.

It will pay you to get the facts on DCA's 4-Star Service!

Doughnut Corporation of America FE-5
Breader & Processor Division
45 West 36th Street, New York 18, N. Y.
Gentlemen:
☐ Please send me your equipment brochure.
☐ I'd like to talk to your technical consultant.
Individual _____
Company Name _____
Address _____
City _____ Zone _____ State _____

There's
NEWS
in Spices!
Statistics now prove Americans are more seasoning conscious than *ever before* in history.
All the more reason *to be sure* you're using high quality, NATURAL SPICES in all your products.
American Spice Trade Association
82 WALL STREET, NEW YORK 5, N. Y.

Ideal for Dairy and Food Industries

The Strahman Spray Nozzle does a better job with the least amount of water. This precision made nozzle enables the operator to get any type stream of water to do his job by simply pressing the lever. A soft spray is sent forth with slight pressure on the lever, and a strong straight stream may be had by pushing the lever all the way down. This convenient control of the wash water assures better cleaning with a lot less effort. The nozzle automatically shuts off the moment the lever is released, thereby eliminating all waste of water.

RENEWABLE RUBBER COVER. The sturdy cover protects the nozzle and your equipment against knocks and dents. When the cover becomes worn, replace it with a new one.

CONSULT YOUR DEALER

STRAHMAN VALVES, INC., 16 HUDSON STREET, NEW YORK 13, U. S. A.

Sealing Rings

Numerous charts give selection data for a series of O-rings used in many sealing applications. Products are composed of a synthetic rubber compound. Catalog 5701, 12p.—*Parker Appliance Co., Cleveland.* (222A)

Electrical Connectors

Covers a group of male and female electrical plugs for waterproof and dustproof connections. Specifications are listed for 2-, 3- and 4-prong units. 2p.—*Rodale Mfg. Co., Inc., Emmaus, Pa.* (222B)

Nut-Running Tool

Concerns advantages of an air-operated nut-running tool that has precision torque control. Unit speeds assembly and disassembly of process equipment. 6p.—*Ingersoll-Rand, New York City.* (222C)

Tube-Working Units

Presents a compact, light-weight tube tool for flaring, bending, cutting and swedging operations. 4p.—*Wilson Mfg. Co., Memphis, Tenn.* (222D)

Non-Electric Soldering Iron

Explains details of a new soldering iron that employs a cartridge heating element. Completely portable unit is available with a variety of working heads. Unit prices are listed. 2p.—*Kemode Mfg. Co., Inc., New York City.* (222E)

Soap Dispensers

Treats of a combination soap dispenser and utility shelf for washrooms. Diagrams show installation of the chromium plated units. 4p.—*American Dispenser Co., Inc., New York City* (222F)

Vibration Mountings

Considers advantages of floating, rail-type vibration mountings for fan and motor bases, designed for a disturbing-frequency of 750 cycles per minute. Catalog FR-55, 4p.—*T. R. Finn & Co., Inc., Hawthorne, N. J.* (222G)

Insulating Tape

Informs on ways to use plastic-coated electrical insulation tape. Varieties available with dielectric strength from 9,500 to 10,000 v. 4p.—*Kendall Co., Polyken Sales Div., Chicago.* (222H)

Wire-Rope Slings

Bulletin pictures a line of preformed slings made of wire rope. Interesting table shows safe load limits for these items at various angles of application. Bulletin 5308-R, 4p.—*MacWhyte Co., Kenosha, Wis.* (222I)

Protective Clothing

Presents a variety of aprons, sleeves, leggings, gloves, and coveralls for protection of maintenance workers. 12p.—*Assoc. Bag & Apron Co., Chicago.* (222J)

MATERIALS HANDLING

Lift Truck Line

Pictures and specifies a full line of gasoline-, LP-gas-, and diesel-powered lift trucks. Wide range of capacities listed. 6p.—*Towmoter Corp., Cleveland.* (222K)

Portable Conveyor

Concerns operation of a portable aluminum conveyor, which will handle loads at inclines up to 30 deg. Selection data is tabled. Bulletin 600. 4p.—*Oliver Corp., A. B. Farquhar Div., York, Pa.* (222L)

Sanitary Bucket-Elevator

Depicts construction of a bucket-type elevator with one removable side. Feature is said to speed cleaning. Five basic models available. Elevates from 4 to 50 ft., with capacities up to 30 cfm. 4p.—*Bucket Elevator Co., Summit, N. J.* (222M)

Box Car Unloader

Describes and pictures application of a spring-loaded, oscillating device for unloading grain cars. Bulletin 2645, 6p.—*Link-Belt Co., Chicago.* (222N)

Low-Lift Truck

Covers features of a riding-type electric lift truck that handles up to 4,000 lb. in low-lift applications. Full specifications are tabled. 4p.—*Lewis-Shepard Prod. Inc., Watertown, Mass.* (222O)

Two-Way Radio Control

Details cost savings in materials handling by using a two-way radio to connect main office with lift truck operators. Compact truck-mounted units cut waste time. 10p.—*Radio Corp. of America, Communications Equipment, Camden, N. J.* (222P)

Sectional Belt Conveyors

Shows combination of pre-built standard belt conveyor components to form heavy conveying installations. Sections are obtainable in belt widths up to 36 in. Book 2579, 8p.—*Link-Belt Co., Chicago.* (222Q)

Flat Wire Belts

Depicts various meshes available in a line of flat wire conveyor belting. Mesh and wire size listed. 4p.—*Wire Belt Co. of America, Cambridge, Mass.* (222R)

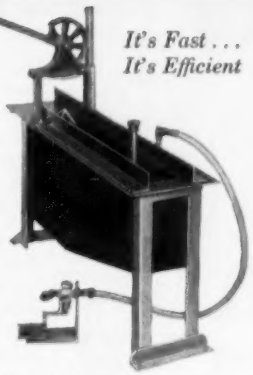
Overhead Trolley

Covers construction and applications of an overhead, trolley conveyor that can be equipped with a variety of hangers. Component parts are pictured. Form RK 56, 4p.—*Rapistan-Keystone Inc., Detroit.* (222S)

Langsenkamp's NEW CAN OPENER

No Waste!
No Mess!
No Slivers!

It's Fast . . .
It's Efficient



Here is a completely new kind of hand-powered unit designed to streamline your can opening operations. One operator opens, drains and rinses six No. 10 cans per minute—*with no wasted product!* Unique bit design positively eliminates the danger of can slivers.

Check these other outstanding features—

- Bit pierces cans from bottom . . . product drains directly into 27 gallon tank.
- All parts contacting product are stainless steel.
- Foot-operated rinsing valve has five powerful spray nozzles to assure 100% removal of product.
- Unit can be used for any product that will drain through a 3" opening.

NOTE—If desired, opening and rinsing mechanism can be supplied without tank. *Write for full details.*

F. H. LANGSENKAMP CO. 227 E. SOUTH STREET INDIANAPOLIS 25, IND.

THE King PRODUCT KOOLER

2 TYPES: Suspended type (left) for ceiling mount or floor type (above) sectionalized for easy installation.

Modern service-tested cooling units for precooling and preservation of foods . . .

"M" series King Koolers operate at slow speed to maintain temperatures 25° to 45° F. with ammonia or freon refrigerants. Centrifugal blower type fans. Air is pulled—not pushed—through coil, saving on power and refrigeration load. Simple defrosting. With automatic temperature control, system defrosts during off cycle when temperatures are above freezing. Water defrosting sprays optional. A compact package unit, easily, quickly installed. Built for long service available in 3000 to 18,000 CFM sizes.

There's a King Product Kooler to fit your needs... Write for your bulletin NOW !

THE King CO. OF OWATONNA
905 N. CEDAR ST. OWATONNA, MINNESOTA
MFRS. OF SHARP BREEZE COOLING, VENTILATING AND HEATING SYSTEMS

HOW NEW AO HAND REFRACTOMETER CUTS COSTS

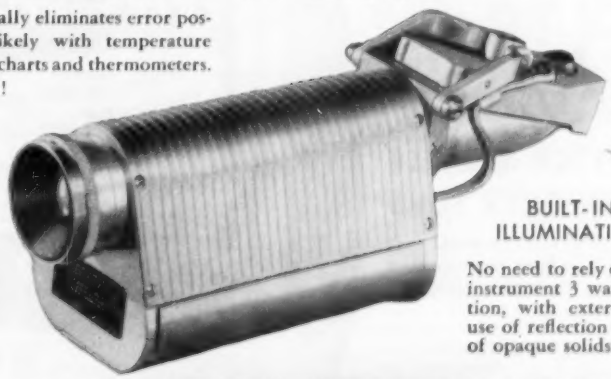
Refractometric determinations are important in your pick or pack problems. The new AO Hand Refractometer will save you time, effort and money . . . here's how.

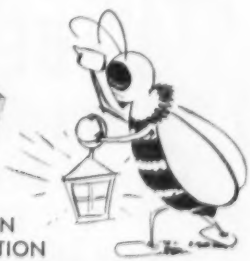
BUILT-IN TEMPERATURE COMPENSATION

Automatically eliminates error possibilities likely with temperature correction charts and thermometers. Saves time!

EASY-TO-READ SCALE

Unusually clear eyepiece image assures reading accuracy to 1/10 of one percent. Dividing line appears in sharp contrast even with dark colored liquids. Scale graduated in increments of 2/10 of one percent, has range of 0-30% sucrose (or degrees Brix).





BUILT-IN ILLUMINATION

No need to rely only on external light. Use instrument 3 ways; with built-in illumination, with external light source, and by use of reflection technique for analyzation of opaque solids.

ANYONE CAN USE IT

New AO Hand Refractometer is fast . . . low cost . . . requires no special training, no computations . . . direct reading scale gives immediate, accurate, on-the-spot determinations.

American Optical
Instrument Division
Buffalo 15, N.Y.

Dept. E 227

Please send full information on the new AO HAND REFRACTOMETER.

Name .....

Address .....

City ..... Zone ..... State .....

PNEUMATIC

makes light work of FOOD PACKAGING

Foods in tins, glass and cartons. Foods of many types, in many sizes of containers. Every day, on PNEUMATIC equipment, foods in profusion are put-up in packages, bottles, cans or jars with great speed, neatness and in tremendous volume to meet the huge daily food consumption.

A representative few of these foods, here shown, include those which are the best known and most widely bought by American consumers. Pneumatic's experience in the field is vast and varied—its intimate knowledge of the many peculiarities of food handling have led to the design of highly adaptable machines that operate at a "lower cost per container."

PNEUMATIC SCALE CORP., LTD., 91 Newport Avenue, Quincy 71, Mass. *Also: New York; Chicago; San Francisco; Los Angeles; Seattle; Leeds, England.*

Packaging and Bottling Equipment

WISSCO BELTS... *improved*

FOR BETTER SERVICE ... TOUGHER JOBS

Let us know your requirements. Improved Wissco Belts are supplied in any alloy to meet your particular conditions.

THE COLORADO FUEL AND IRON CORPORATION—
Denver and Oakland

WICKWIRE SPENCER STEEL DIVISION—
Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York • Philadelphia

2210

WISSCO BELTS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CF&I

Spray Nozzles FOR EVERY REQUIREMENT...

Delavan Nozzles are available in a full range of capacities and spray patterns for every application.

NEED NOZZLES ?

Delavan Catalog 32 is cross-indexed to make it easy for you to select the best nozzle for your specific requirements. Write for Catalog 32.

DELAVAN *Manufacturing Co.*
West Des Moines, Iowa

PACKAGING

Spot Labeler

Bulletin pictures and diagrams operation of a spot labeller for round bottles and jars having a capacity of up to 300 units per minute. Container and label ranges are tabled with other specifications. Bulletin 129, 4p.—*Pneumatic Scale Corp., Ltd., Quincy, Mass. (225A)*

Packaging Machine

Concerns wide line of weighers, baggers, cartoners, and sealing machines for food products. Both standard and custom units are shown. 28p.—*Wright Machy. Co., Durham, N. C. (225B)*

Accumulator, Bundler

Describes machinery that eliminates hand labor in grouping small product cartons into single multi-unit package. Diagram shows floor layout of machine, which handles glue or heat-sealing wrapping materials. 4p.—*Hayssen Mfg. Co., Sheboygan, Wis. (225C)*

Liquid Filler

Concerns features of a 12-station gravity filler for single strength juices and syruping applications. Unit is rated for speeds up to 425 containers per minute. 2p.—*W. F. & John Barnes Co., Rockford, Ill. (225D)*

Modern Packaging Lines

Comprehensive catalog lists wide line of equipment for washing, filling, corking, capsuling, and labeling bottled products such as wines, oils, vinegars, and soft drinks. 50p.—*Chelle Limited, London, England. (225E)*

Paper Bottle Filler

Depicts action of a paper-bottle filler for dairy products, handling up to 25 qt. per minute. Electric eye shutoff gives automatic operation. Detector finger insures proper carton positioning. Bulletin G-501, 4p.—*Cherry-Burrell Corp., Chicago. (225F)*

Seafood Wrapper

Presents automatic unit for overwrapping packaged seafoods. It contains electric eye register for printed designs and is easily adjusted to a wide range of package sizes. 4p.—*Hayssen Mfg. Co., Sheboygan, Wis., (225G)*

Bread Banders

Presents machine attachment for laminating bread bands to cellophane wrappers. Lists various advantages for the new method. 2p.—*Rap-In-Wax Paper Co., Minneapolis, Minn. (225H)*

Bag Packer

Leaflet gives facts on air-operated filling machine for bags. Operates on 4- to 6-cfm., 60- to 80-lb.-pressure air supply. Accuracy is within 2 oz. 1p.—*Black Products Co., Chicago. (225I)*

Piston Fillers

Shows a line of sanitary, piston-type fillers, rated for speeds up to 1000 containers per minute. They will handle can sizes to 32 oz. 4p.—*W. F. & John Barnes Co., Rockford, Ill. (225J)*

Air Power Stapler

Considers advantages for a portable, air-powered stapling machine used on product cartons. Pictures show actual operation, diagrams illustrate stapling action. 4p.—*Container Stapling Corp., Herrin, Ill. (225K)*

Plastic Suppliers

Gives nationwide listing of plastic-packaging suppliers by states and cities. It contains specific reference to type of packaging and polystyrene, polystyrene foam, and polyethylene plastic materials carried by each firm. Bulletin C-6-211, 90p.—*Koppers Co., Inc., Pittsburgh. (225L)*

Bagging Scales

Specifies three basic styles of an open-type net weigher for free flowing materials—portable floor type, overhead portable, and overhead stationery models. Diagrams illustrate special features and accessory equipment. Optional discharge systems are described. Bulletin 8246A, 6p.—*Richardson Scale Co., Clifton, N. J. (225M)*

QUALITY CONTROL

Electric Oven

Presents line of polished, stainless steel laboratory ovens for temperature applications to 649 C. Bulletin 5520, 4p.—*Soiltest, Inc., Chicago. (225N)*

Moisture Testers

Shows variety of sample pans, ovens, balancers, and desiccators for use in product moisture determinations. Bulletin SL-1, 12p.—*Harry W. Dietert Co., Detroit. (225O)*

Chemical Compounds

Pocket catalog contains wide list of various compounds for nutritional, biochemical, bacteriological, microbiological, and biological research. Prices included. Mar. 1956 issue, 62p.—*General Biochemicals, Inc., Chagrin Falls, Ohio. (225P)*

General Lab Apparatus

New edition of *What's New for the Laboratory* lists full line of general laboratory equipment that includes freeze driers, temperature indicating controllers, high vacuum pumps, pan balancers, microscope slides, and a small air compressor. No. 25, 16p.—*Scientific Glass Apparatus Co., Inc., Bloomfield, N. J. (225Q)*

PREST-O-MATIC® ELECTRIC COLD STORAGE DOORS SAVE TIME and REFRIGERATION

Prest-O-Matic Doors save refrigeration by reducing "open-door-time", up to 75%. Doors are kept closed when not in use. Heat stays out, cold stays in.

Fork lift truck traffic moves through Prest-O-Matic doors quickly and automatically. No need for driver to dismount to open door.

Electrically operated Prest-O-Matics are supplied as complete units, easily installed. They seal tight when closed and slide out of the way when open. Available in single or double sliding models for coolers or freezers.

Send for complete information.

FINE DOORS SINCE 1878

CLARK DOOR CO.

505 Hunterdon St., Newark 8, N. J.

Who put the Ac'cent in Mrs. America's Chicken Pot Pie?

The giants of the fast-growing convenience food industry used monosodium glutamate in hundreds of millions of chicken pot pies last year. Ac'cent protects flavor in canned and frozen foods...makes *all* heat 'n eat foods taste better. Because flavor is important in selling your product, wouldn't Ac'cent help build brand preference by building flavor?

Let us show you how Ac'cent can improve flavor. Just drop us a line. We'll send you this important information, and a special Ac'cent file folder to keep it handy. No obligation. Ac'cent • International, 20 N. Wacker Dr., Chicago 6, Ill.

Accent®

BRAND

Pure Monosodium Glutamate

The "King Zeero" Recirculated Ice Water System Eliminates using an Agitator Motor

4 "King Zeero" No. E-612-W Ice Builders in use at Sturtevant Dairy Products, Rock Island, Ill.

Patented Built-In Louvers provide Automatic Agitation without power, using only the suction of the recirculating pump

- No propellers, submerged bearings, or extra pumps to give trouble.
- Sufficient velocity, turbulence and length of travel adequately cool the water on its way through the ice field.

32°-34° ICE WATER assured at all times

- The "King Zeero" delivers the COLDEST water LONGER, for less outlay. -- affords maximum economy in operation and maintenance. Smaller compressor needed lowers demand charge.

The sales representatives of the leading lines of dairy and refrigeration equipment who call on you will be glad to discuss details with you.

THE KING ZEERO COMPANY
4300-14 W. Montrose Ave., Chicago 41, Ill.

Next time you replace spray nozzles . . . be sure they're from Spraying Systems. See for yourself how properly engineered, precision machined spray nozzles can improve performance. With Spraying Systems you gain all the advantages of advanced research and production . . . from America's leading designer and producer of spray nozzles.

you improve when you replace with

SPRAY NOZZLES

from SPRAYING SYSTEMS

Free Catalog
Complete information . . . forty-eight fact loaded pages. Write for Catalog 24.

SPRAYING SYSTEMS CO.
3212 Randolph Street • Bellwood, Illinois

What's a '12-Issue' Encyclopedia?

Why, twelve issues of FOOD ENGINEERING, of course! And now you can have your own "encyclopedia" by keeping *your* copies in a handy Jesse Jones Volume File. Annual Index in December issue.

The files are compact, smart looking, come in rich red-and-green covers of elephant-hide toughness. Washable, permanently attractive, they include gold lettering of 16 carat.

Best yet, they're reasonably priced! Only $2.50 each, 3 for $7.00, 6 for $13.00; shipped postpaid. If ordering outside the U. S., add $1.00 for postage.

Satisfaction unconditionally guaranteed—or your money back. Just send your check or money order covering the number of files you want to:

JESSE JONES BOX CORP.
P. O. Box 5120 Philadelphia 41, Pa.

Brewed Coffee Flavor

Research results concern effect of water impurities on flavor of brewed coffee. Effect of iron on product color is also discussed. Publication 6, 12p.—*Coffee Brewing Institute, Inc., New York City. (227A)*

Pilot Centrifuge

Treats of compact, pilot plant instruments with interchangeable bowls that can be used for separating, extracting, clarifying and mixing. They feature enclosed, foamless pressure discharges that prevent oxidation and losses of volatile liquids. Bulletin 2174, 4p.—*Centrico Inc., Englewood, N. J. (227B)*

Automatic Sampler

Leaflet describes an in-line, automatic sampling device containing a timer that permits continuous intermittent operation. Sample volume can be controlled between 0 and 15 cc. 2p.—*Langsenkamp-Wheeler Brass Works, Inc., Indianapolis. (227C)*

Lab Homogenizer

Gives all facts on a series of laboratory-sized, electric-powered homogenizers, developing operating pressures up to 10,000 psi. Maximum capacities: 25 gph. Bulletin LH-55, 4p.—*Manton-Gaulin Mfg. Co., Inc., Everett, Mass. (227D)*

Hand Refractometer

Automatic temperature compensation, 0.1% accuracy, and a sucrose scale from 0 to 30% are several features listed for a new hand refractometer. Photos show device, which is also equipped with built-in illumination. 2p.—*American Optical Co., Instrument Div., Buffalo. (227E)*

Laboratory Glassware

Comprehensive catalog and price list covers a very-wide range of laboratory glassware. Items range from all types of flasks and bottles to tubing and glass stop cocks, funnels and various other laboratory aids. Catalog LB 36, 206p.—*Corning Glass Works, Corning, N. Y. (227F)*

INGREDIENTS

Flavor and Seasoning Catalog

Informative, tabbed reference book and catalog lists flavors, seasonings, and certified colors for a wide variety of food products. Price list and index included. 70p.—*Dodge & Olcott, Inc., New York City. (227G)*

Enrichment Price Lists

Two price sheets show new, lower prices on bread enrichment tablets and starch based enrichment premix for bakers. Both products contain various vitamins and minerals used in bread and flour fortification. 2p.—*Sterwin Chemicals, Inc., New York City. (227H)*

Fruit Processing Units

Bulletin pictures and specifies a series of fruit slicers, sugar mixers, and shaker washers for use in food processing. Advantages and applications are detailed. 8p.—*H. A. Reinhart Co., Newton, Ohio. (227I)*

Thickening Agent

Considers technical facts on a series of three gums, said to have eight times the thickening ability of most starches. Physical and chemical properties are noted. 4p—*Burtonite Co., Nutley, N. J. (227J)*

Antibiotic Dip

Technical bulletin concerns procedure, advantages, and precautions in applying chlortetracycline to poultry. Method cuts bacterial load and increases shelf life. Technical Bulletin No. 10, 14 p.—*American Cyanamid Co., New York City. (227K)*

Fatty Acid Esters

Manual presents full information and properties of a series of glyceryl, glycol, and polyethylene glycol esters, used as stabilizers, defoamers, and surface-active, emulsifying, and wetting agents. 25p.—*Glyco Products Co., Inc., New York City. (227L)*

TRANSPORTATION

Packaged Truck Coolers

Specifications, dimensions, and features of a compact, packaged, electrical system for mechanical truck refrigeration are detailed. Drawings show installation. Bulletin GEA-6084, 4p.—*General Electric Co., Schenectady. (227M)*

Special Flat Car

Concerns features and dimensions of a new railroad flat car, particularly designed for "piggyback" and unit load operations. Cost factors are discussed. 4p.—*American Car & Foundry Industries, Inc., New York City. (227N)*

Truck Bodies

Full-color bulletin stresses features of a line of 5,400- to 18,000-lb. trucks, with particular emphasis on multi-stop bodies. All-steel, metal alloy, and plastic units are covered. 24p.—*International Harvester Co., Chicago. (227O)*

Truck Signs

Colorful catalog depicts a wide variety of decal truck signs for displaying company name and product. Most examples shown are food industry applications. 22p.—*Meyercord Co., Chicago. (227P)*

MANAGEMENT

Research Center

Depicts facilities and services of a scientific research and development organization available for industrial use. 16p.—*Spencer-Kellogg & Sons, Inc., Buffalo, N. Y. (227Q)*

Electronic Computers

Bulletin covers a series of training films that detail usefulness of electronic computers in speeding business calculations. 4p.—*American Management Assn., New York City. (227R)*

Computer Seminars

Bulletin describes a series of seminar-courses for executives on use of electronic data-processing systems. 8p.—*Sperry-Rand Corp., Remington-Rand Div., New York City. (227S)*

Leasing Plan

Gives facts on an equipment rental plan that provides for a flexible leasing term with four available terminal options: Continued rental, purchase, trade-in on new equipment, or rebate on returned equipment. Other plan features noted. 4p.—*National Equipment Rental, Ltd., Long Island City, N. Y. (227T)*

Business Forms

Lists wide line of carbon-interleaved forms for business records. Included are bills of lading, purchase orders, statements, reports, and many other forms. 1956 catalog, 24p.—*Alfred Allen Watts Co., Inc., Allwood, Clifton, N. J. (227U)*

Shipping Stencils

Discusses a method of preparing shipping stencils with a typewriter at the same time normal paper work is being accomplished. Also shows a continuous, strip-type stencil form. 4p.—*Weber Marking System, Mt. Prospect, Ill. (227V)*

SANITATION

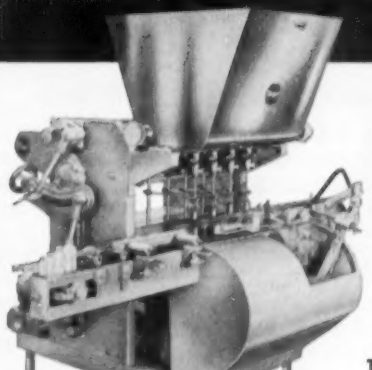
Mechanized Cleaning

Bulletin gives brief run-down on various mechanical aids to speed plant and equipment cleaning. Nozzles, guns, and foam generators are discussed. 12p.—*Oakite Products, Inc., New York City. (227W)*

New Hand Cleaner

Specifies features of a new hand-cleaning detergent that also contains a bacteriostat and skin softener. Compound is said to be particularly efficient in removing tough dirts. 2p.—*Oakite Products, Inc., New York City. (227X)*

Immediate Savings . . . WITH



ESTABLISHED Hope SINCE 1908

TYPE 19A

The 4 line model *accurately* fills 50 to 100 containers per minute . . . 6, 8 and 10 line models also available capable of *accurately* filling up to 250 containers per minute. Hope Type 19A Filling Machines are now in profitable use from coast-to-coast filling liquids, semi-liquids or viscous products in jars, plastic bottles or tin cans. For high speed, accurate filling machines look to the leader —

Write for catalog of our complete line

HOPE MACHINE COMPANY

9400-40 STATE ROAD • PHILA. 14, PA.

"Another product safely shipped in Inland 'protection-ered' Containers"*

SWEET THINGS take a bit of pampering

When Joey treats Sue to a super-duper soda or sundae down at the corner sweet shop, it's possible that Limpert Bros. of Vineland, New Jersey, was a partner to the occasion. Limpert daily ships delicious true fruit flavors and extracts to all parts of the country. They're shipped in Inland "protection-ered" containers—steel drums with a special sanitary lining that protects the flavor and purity of these "sweet things" during shipment.

According to Sidwell B. Thomas, Limpert's Sales Manager, the company saved 20% in labor costs (packaging and handling) as a result of switching from wooden barrels to steel containers. He also feels that Inland containers provide Limpert with an important sales advantage.

NOW . . . ABOUT *YOUR* PRODUCT. Could the *right* container lining solve your problem of maintaining quality-in-transit? Chances are steel packaging by Inland can give you just what you need. The full story is well worth your time. Write Bob Boecher, Dept. 315B.

**the right container, with the right lining for your product.*

Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company • 6532 South Menard Avenue • Chicago 38, Illinois • Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio

PROFESSIONAL SERVICES

PROCESSING PROBLEMS — PRODUCT DEVELOPMENT — MARKET RESEARCH —PLANT LAYOUT and DESIGN—PACKAGE DESIGN and TESTING MANAGEMENT — PUBLIC RELATIONS — GENERAL CONSULTING — PATENTS — CHEMICAL, BACTERIOLOGICAL and NUTRITIONAL ANALYSIS

J PAUL BISHOP & ASSOCIATES
Registered Professional Engineers
Established 1948
Specializing in:
Food and Chemical Processes:
Consultation—Surveys—Design
Engineering—Estimates—Supervision
of Construction, Installation and Start-Up.
Internationally Known
P. O. Box 348 Champaign, Illinois

GUSTAVE T. REICH & ASSOCIATES
Consultant to the Food Industries.
COMPLETE CONTINUOUS PROCESSES.
Operation — Waste Disposal
AUTOMATION
1422 Chestnut St. Philadelphia 2, Pa.

STRASBURGER & SIEGEL
Chemists—Bacteriologists—Food Technologists
Specialists in Canned and Glassed Foods
Laboratory Services
Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Libels, Expert Testimony
1403 Eutaw Place Baltimore 17, Maryland

FOOD DEVELOPMENT LABORATORY
S. W. ARENSON, *Director*
Ingredient evaluations • New Products development. Specializing in flour shortenings, milk and other basic ingredients • Facilities; chemical and physical laboratory, bakery, spray dryer and other unit process equipment.
2865 W. Franklin St. Baltimore 23, Md.
440 W. 24th St. New York, N. Y.

SCHWARZ LABORATORIES Inc.
Consultation on Food Problems
Analyses of Foods and Beverages
Food Plant Design and Process Improvement
Research and Investigations
Legal Testimony
Write for bulletin describing facilities and services
230 Washington St., Mount Vernon, N. Y.

WALTHAM LABORATORIES, INC.
LABORATORY SERVICES: Food analysis, extraneous matter, bacteriological tests. Water
FOOD PLANT SANITATION — INSPECTION & SAMPLING
817 Moody Street Waltham 54, Mass.

LEWIN ASSOCIATES
Industrial Consultants
DAVID N. LEWIN, Ph.D., FOOD CONSULTANT
JOSEPH D. LEWIN, CONSULTING ENGINEER
Design — Layouts — Investigations — Consultation — Reports — Market Investigations — Bakeries, Dairy Products—Food Preserving by Heat, Drying, Freezing — Consultation in Managing, Warehousing, Distribution — Formulae, New Products
243 West 56 St., N. Y. 19, N. Y. JUdson 6-1749

FOSTER D. SNELL
Research Laboratories
SENSORY PANEL TESTS
Food Analysis, Stability Studies, Evaluations, Packaging Problems, Vitamin Assays.
Write For "Food Facts"
29 W. 15th St., N. Y. 11 Watkins 4-5490

WISCONSIN ALUMNI RESEARCH FOUNDATION
Projects, Consultation, and Production Control Services in
Biochemistry, Chemistry, Bacteriology, Toxicology—Insecticide Testing and Screening.
Write for price schedule.
P. O. Box 2217-P. Madison 1, Wisconsin

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO., INC.
PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

WHERE TO BUY

For information on
WOOD PIPE • WOOD TANKS WOOD SPECIALTIES
contact
NATIONAL PIPE AND TANK CO.
2301 N. Columbia Blvd., Portland Oregon

INGREDIENTS FOR THE FOOD PROCESSOR

CARROT OIL makes food golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.
Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET
New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

the advertisements in the SEARCHLIGHT SECTION on the following pages

are live opportunities in the field of food processing and distribution.

Each announcement represents a current Want or Offering of an organization or individual in the field, with some element of profit in each for whoever can fill the need. Some have money-saving possibilities, others are opportunities for more business; still others offer property, or equipment—used or surplus new equipment.

"Searchlight" advertisements are constantly changing. New opportunities are constantly finding their way into this great Want medium, each issue. Regular reading of the "Searchlight" pages can be as important to you as reading the editorial sections; "Searchlight" is NEWS OF OPPORTUNITIES offered in the industry.

for EVERY business WANT "Think SEARCHLIGHT first"

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered

Employment Agencies
Employment Services
Labor Bureaus

RATES

DISPLAYED

The advertising rate is $18.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

UNDISPLAYED

$1.50 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Positions Wanted—The rate is one-half of the above, payable in advance.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS or Inquiries to Classified Advertising Division of FOOD ENGINEERING, 330 W. 42nd St., N. Y. 36, N. Y.

DIRECTOR OF ENGINEERING

We are seeking a Director of Engineering. The blueprint of his specifications includes: *"Education as an engineer. Age 35-45. At least 10 years of progress through the engineering departments of a medium-sized, or larger, packaged-processed-product (chemical or food rather than "hard" goods) manufacturer employing the most modern production techniques. Present or very recent position—chief engineer or his principal assistant with a salary of at least $12,000 a year with a company in the food, drug or allied product field. For at least the past 5 years, responsibility for all new construction and equipment, as well as other engineering functions. A record of real accomplishment, rather than a potential for accomplishment."*

The salary potential is a minimum of $20,000; headquarters, Mid-Atlantic seaboard; environment, city, with a minimum of travel; potential employer, company with most modern plant in its industry.

If you are interested and can meet the qualifications stated, reply stating your present position, your education, your experience in brief resume form, full personal statistics and a brief description of that achievement you most esteem that contributed to your progress. Your reply will be kept most confidential, and any interview resulting is to be kept in strict confidence by you as well.

P-1467, Food Engineering
330 W. 42 St., New York 36, N. Y.

WANTED
MECHANICAL ENGINEER

Kentucky location of national concern has excellent permanent situation in plant engineering department for mechanical engineer with approximately two years experience in operation and maintenance of automatic bottling and labeling equipment. Must have desire for early recognition of ability and performance since position open is in direct line for possible early advancement to greater responsibility in engineering or production.

No traveling required. Attractive starting salary. Excellent benefit program.

Please submit complete resume, including details of education and experience and state starting salary required. Your reply will be held confidential.

P-1335, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOOD OR DAIRY ENGINEER

International organization assisting under-developed countries improve local diets seeks experienced engineers who know food or milk treatment equipment and processes, to augment present small staff international engineers.

Engineers must have the ability and tact to deal and negotiate with top government officials as well as all levels of technical workers. Engineering work is of non-commercial nature, but knowledge of commercial practices is highly desirable.

Positions are located at New York and involve international travel. Good salaries and liberal side benefits. Presents unique opportunity in field of constructive international cooperation.

Write giving age, education, experience and salary requirements.

P-1508, Food Engineering
330 W. 42nd St. New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Wanted experienced quality control man for position with opportunity in one of the Southwest's largest fruit and vegetable canning plants located in a city of 40,000 population in the lower Rio Grande Valley of Texas. Must be experienced in general vegetable lines. Will consider recent graduated Food Technologists. Write Harlingen Canning Co., P. O. Box 31, Harlingen, Texas, giving age, education and past employment history.

Chemist—Food Technologist—growing mid-west food processing firm located in Kalamazoo, Michigan, seeks graduate chemist to open new department. Must be qualified to run analytical tests, solve related problems, act as supervisor. Interesting position, opportunity for future. Write P-1490, Food Engineering, with education, experience and required salary.

Wanted—Plant mgr. for growing concern mfg. salads & allied food products. Must have pkging exp., steady. Write exp., ref. & desired salary to: P-1605, Food Engineering.

SELLING OPPORTUNITY OFFERED

Established food manufacturer of institutional food specialty products, in business for over 50 years, is desirous of securing food brokers or commission salesmen who are presently selling food items to the institutions market in key areas throughout the country. Give present lines and territories covered. Address Mr. Milton Baldock, G. A. Goodrich Company, 4139 W. Grand Avenue, Chicago, Ill.

EMPLOYMENT SERVICE

Salaried Personnel, $5,000-$30,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, P.O. Box 674, Manchester, Vermont.

POSITIONS WANTED

Food Dairy Technologist—Chemical Engineer extensive varied experience technical engineering, supervision, quality control, process operation, personnel, maintenance, production. Knows research, development, modernization, construction. Seeks high level liaison, managerial, executive responsibilities. PW-1236, Food Engineering.

WE NEED
FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES
—junior to top-level

Call, write or wire:
Gladys Hunting (Consultant)
Drake Personnel, Inc.
220 S. State St., Chicago 4, Ill.
HArrison 7-8600

POSITIONS WANTED

Mechanical Engineer—age 30—desires plant engineering work in canning plant or project engineering work with canning equipment manufacturer. Desired location: Eastern seaboard States. Now with a supplier of the canning industry. PW-1633, Food Engineering.

Consultant—Food Technology professor available as consultant during summer. PW-1447, Food Engineering.

FOR RATES OR INFORMATION
About Classified Advertising

Contact The McGraw-Hill Office Nearest you

ATLANTA, 3
1321 Rhodes-Haverty Bldg.
WAlnut 5778
W. KEARNS

BOSTON, 16
350 Park Square
HUbbard 2-7160
H. J. SWEGER

CHICAGO, 11
520 No. Michigan Ave.
MOhawk 4-5800
W. HIGGENS

CINCINNATI, 37
1915 Rockingham Ave.
REdwood 1-4537
W. GARDNER

CLEVELAND, 15
1510 Hanna Bldg.
SUperior 1-7000
W. SULLIVAN

DALLAS, 2
Adolphus Tower
Main & Akard Sts.
D. BILLIAN

DETROIT, 26
856 Penobscot Bldg.
WOodward 2-1793

LOS ANGELES, 17
1125 W. 6 St.
MAdison 6-9351
P. CARBERRY

NEW YORK, 36
330 West 42 St.
LOngacre 4-3000
R. LAWLESS
S. HENRY
D. COSTER
R. HATHAWAY

PHILADELPHIA, 3
17th & Sansom St.
Rittenhouse 6-0670
H. BOZARTH
E. MINGLE

PITTSBURGH, 22
919 Oliver Bldg.
Atlantic 1-4707
W. SULLIVAN

ST. LOUIS, 8
3615 Olive St.
JEfferson 5-4867
W. HIGGENS

SAN FRANCISCO, 4
68 Post St.
DOuglas 2-4600
W. WOOLSTON

(Additional Position Vacant Advertising on opposite page)

ADVERTISING MAN WANTED FOR TECHNICAL PRODUCTS

- Previous advertising experience not necessary but helpful. Must have at least two or three years of college with courses in engineering and technical subjects and like to write.
- If you have the qualification we have an opportunity open for you. Man selected will be trained in all phases of industrial advertising. In your letter of application state age, education, positions held, and give statement of why you want a career in advertising. Location: well-known Connecticut company.

P-1206, Food Engineering
330 W. 42 St., New York 36, N. Y.

SALESMEN

For canning machinery sales and customer contact work. Several openings available. Applicants with mechanical or chemical engineering degree and cannery experience preferred. Please send resume of education, exprience, refernces, salary requirement and recent photo, if available, to:

Canning Machinery Division
FOOD MACHINERY AND CHEMICAL CORPORATION
Hoopeston, Illinois

Attn: John R. Hughes, Personnel Mgr.

SALESMEN

One of nation's leading manufacturers of flavorings with head offices in the midwest has openings for:

Experienced salesman with own following who knows the flavoring business and is ready to take on additional responsibilities and move up the income ladder. Substantial draw on commissions. Traveling expenses paid.

Junior salesman who is familiar with flavoring sales, anxious to get ahead and willing to learn. Salary commensurate with background.

Our employees know of this ad. All replies treated in strict confidence.

SW-1459, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

Chemist or Food Technologist

College graduate, major in chemistry, or food technology, primary interest fruit products. For work in midwest food plant, quality control. Age preferred 22 to 40.

P 1420 Food Engineering
520 N. Michigan Ave. Chicago 11, Ill.

New Advertisements

received by May 25th will appear in the June issue subject to limitations of space.

Classified Advertising Division
FOOD ENGINEERING
330 West 42nd St. New York 36, N. Y.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES **EQUIPMENT - USED or RESALE**

UNDISPLAYED —RATES— *DISPLAYED*

$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line. BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

The advertising rate is $13.25 per inch for all advertising apearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADS or Inquiries to Classified Advertising Division of Food Engineering, 330 W. 42nd St., N. Y. 36, N. Y.

····IN STOCK AT LOEB'S····

Cappers: Capem, Titecap, Swanson, U. S. automatic and semi-automatic.
Centrifugals: Fletcher 12" copper, 17" stain. steel, 20" lithcoated, Tolhurst 26" copper.
Clarifiers: De Laval model 84-51, Sharples Vaporite, st. steel.
Conveyor, port. Rapid Standard, 16' lg.
Conveyor Tables: belts from 5½" wide x 12' long and up.
Cutter, Bone: Wausau, 5 hp.
Cutters, silent, Buffalo 32" and 43".
Demineralizer: Barnstead 80 GPH.
Disintegrator: Rietz RD-18 st. steel, 75 hp.
Dryer: Devine 2x 4' vac. drum, st. steel.
Dryers: vacuum shelf, Stokes 20 shelf, Devine 10 shelf, Devine 20 shelf.
Dryer: Bowen lab. spray, st. steel.
Extractor: Troy 26" monel basket.
Fillers, liquid: Peerless 6 valve, Cass gross weight, siphon and vac. types.
Fillers, piston: Stokes, Colton, Elgin, Filler Machine Co. for jars, tubes.
Fillers, powder: Speedee, Triangle, Stokes & Smith, Ferguson, Gump.
Filler Presses: Sperry, Shriver 6"-36", recessed and plate and frames types.
Filters: int. pressure—Alsop, Sparkler, Lamax, Industrial, Sweetland.
Filter, vacuum: Oliver 2½x1'.
Homogenizer: 2-1200 GPH. Union, 300 GPH. Union, 125 and 400 GPH. Gaulin.
Kettles, Stainless steel 5 to 300 gal., with and without agitators, aluminum 40 to 100 gal.
Labelers: Burt, Knapp, New Jersey, World. Ermold—auto and semi-auto. Colloid: Premier 3 hp. and 5 hp.
Mills, hammer: Mikro, 2DH, 2TH, Gump #1, Prater, Raymond, Jay Bee, Jeffrey 30 x 24", Williams #2 and BX.
Mixers: Dough type single and double arm, 5 to 100 gal. Powder: 50 to 2000 lb. capacity. Portable Electric: ¼ to 5 hp.
Pasteurizer: Wallace-Walker plate type, 200 GPH., st. steel.
Pumps: Centrifugal, rotary, gear, vacuum, all types and sizes.
Screens: Rotex 20 x 48", 42 x 84". Roball 40 x 120" stainless steel. Selectro 4 x 10', Abbe Blutergess #1.
Sealers, carton: Standard-Knapp, Ceco, Triangle, Packomatic.
Sterilizers: Climax 20" x 36" jacketed.
Tablet Presses: single punch and rotary.
Tanks: Glass lined, various sizes. Stain. steel 25 gal. to 1200 gal.

Send us your inquiries and list of idle equipment.

LOEB EQUIPMENT SUPPLY CO.

820 West Superior St. **Chicago 22, Ill.**
Telephone: Seeley 7-1431 **Our 31st Year**

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

BUSINESS OPPORTUNITY

Wanted: Well rated food company desiring to add processing of pickle products to present lines. Fresh-pack salt stock, all varieties to Jar, Sweet, Dill etc. Successful food chemist 20 years consulting experience. BO-8290, Food Engineering, 520 N. Michigan Ave., Chicago 1, Ill.

WANTED

Anything within reason that is wanted in the field served by Food Engineering can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

THE MACHINERY & EQUIPMENT CORP.

293 Frelinghuysen Ave., Newark 5, N. J.
TAlbot 4-2050
FOR BETTER SERVICE!
Serving THE FOOD and CANNING INDUSTRY for over 20 years with the best in USED and REBUILT PROCESSING and PACKAGING EQUIPMENT.

"Day" #6 Double Arm Mixer; 100-8000# Mixers, all types; Bag Fillers; 1000 gal. S.S. Tanks; Roller Mills 5x12, 12x32, 16x40; 48-HP motor; Complete Liquid & Power Filling-Packaging Lines, cheap; Rotex #7 Sifter; 24x24 Glum. FP; Simplex Colloph. Bag Formers & Sealers.

I. E. NEWMAN, 5602 Blackstone, Chicago 37

FOR SALE

2—200 HP B & W water tube boilers 160 lb. pressure, excellent condition May be seen in operation. $5,000 each as is, where is.

2—#9 Diana dicers Mfg. by C. E. Dipple Co. ½, ⅝, ¾, 1" dicers good condition, with 220 volts, 60 cycle, 3 phase motors, $400 each.

1—Buffalo silent cutter, Mfg. by John Smith, model 44, serial #30 complete with Westinghouse 20 HP motor, 3 phase, 60 cycle, 220 240 volt motor. One extra set of knives, excellent condition, used less than 50 hours. $1500.

1—Urschel Model SL Slicer, serial #147, New, used experimentally only. Complete with two motors. Makes ½ and 1" slices. $2250.

1—Ayars 9-pocket pea and bean filler. 307 and 303 parts, fair condition, $300.

1—Eckhart Bean Cleaner, model M5-R-163 Good Condition, $300.

1—Boutell Pickle Slicer, model BMC serial #245, $200

6—Herman Nelson unit ventilators, model DJ 1200 CFM excellent condition $300 each.

BURNHAM & MORRILL COMPANY

BOX 1871 **PORTLAND 2, MAINE**

FOR SALE

1 Giant Goshen Hydraulic Juice press .....$750.00 F.O.B.
1 World Semi-Automatic Spot Label Machine .....$200.00 F.O.B.

RICH & MORGAN, INC.
ATLANTA, GA.

FMC

TOP QUALITY EQUIPMENT AT LOW REBUILT PRICES

30 Years of Reliability
YOUR BEST GUARANTY

KETTLES
New and used Kettles in Stainless, Nickel, Aluminum, Copper, Steel, Glass Lined, Iron, in all wanted sizes Steam Jacketed or Unjacketed; some with agitators.

TANKS
In stock at all times STAINLESS STEEL Vertical and Horizontal Tanks, with or without covers; with or without agitators- all sizes:
4168 Stainless 3200 Gal. Oval (milk truck type) Tank; 4'x6'x21' with 18" manhole and 4 cradles.
4059 E1 A. O. Smith Stainless Lined 20,000 Gal. Pressure Tanks' (1351) 10'x30'; vertical or horizontal use.

VACUUM PANS, COOKERS, EVAPORATORS
2544 Pfaudler Glass Lined Closed Top Jacketed Vessel 4'x4'.

Large Stock on Hand Now
PFAUDLER REACTORS
Glass Lined — Jktd — Agtd
50 Gal—100 Gal—500 Gal—1000 Gal

9988 H 1 Aluminum Jacketed Vacuum Pan 250 gal. 40" Diameter; manhole.

RETORTS
Always in stock, standard 3 Basket Retorts 40"x72".
3259/64 Horizontal Retorts 66"x14' long with double track and door opening at each end; steam pipes full length.
All types of Dryers, Flakers, Rotary and Drum Types; Tray and Truck types either for Vacuum or Atmospheric pressure; Ovens, Crystallizers, Sterilizers, Humidifiers, Air Conditioners, etc.

MIXERS
Large stock on hand of new and Reconditioned Double Ribbon Mixers for Powders, granulars, crystals, etc. from 200 lbs. to 5,000 lbs.
2189 J. H. Day, Jacketed Double Ribbon Mixer 28"x28"x79"; 175 Gal.
2189 Readco Jacketed Double Ribbon Mixer; 10"x48"x13"; 210 Gal.
2832/G7 J. H. Day, Jacketed Egg Clipper Mixer; 32"x32"x28".
3951/U2 Heavy Duty 200 Gal. Dough Mixer; 30"x36"x42"; geared both ends; 10 Hp.

JUICE EXTRACTORS—PULPERS
1971/G1 Chisholm-Ryder, American Utensil Stainless Model B Juice Extractor.
3108/G1 Indiana Brush Type Finisher with Stainless Steel Screens.

CUTTERS, CHOPPERS, GRINDERS, ETC.
2936/E1 Anderson Model No. 4 Dicer with 1 Hp.
3628 D 1 Cincinnati Meat Grinder 4½" Screw with 10 HP motor.
3484/A 31 Sterling Carborundum Type Potato Peeler with 2 HP motor.

FILLERS
2184/B45 Berlin Chapman 15 Station Syruper-Filler; up to No. 3's.
3653/M1 Berlin Chapman 7 Station Stainless Filler up to No. 10's.
2288/W1 Hartz Stainless 14 Station Gravity-Vacuum Filler up to quarts.
Karl Kiefer Rotary Vacuum Fillers; 12, 16 and 18 Station Machines on hand.
3651/M2 Ayers Stainless 12 Spout Series C Filler up to 5' dia. containers.
4042/G2 Pneumatic Scale 16 Spout Automatic Straight Line Filler.
Filler Machine Co. Piston Fillers; 2, 4, 7 and 11.
3484/A44 M. & S. 10 Pocket Stainless Steel Fillers.
4031/B1 M. & S. 6 Pocket Bronze Filler No. 2.
3640/S1 FMC Hand Pack Filler with 2 Stainless Rotating Tables for 203 and 308 Cans.
Stokes & Smith Auger Type Semi Aut. Powder Fillers Model G up to 5 lbs.
3673/L34 Triangle Elec-tri-pak Automatic Weigher-Filler 4 Station Model A4 with conveyor.

CAPPERS
Rosina single and double head automatic Cappers; Capem single and double head Cappers; Pneumatic Scale 4 head Capper.

LABELERS
Wrap around Labelers for cans, and round bottles, jars, etc., by Standard-Knapp, Burt, Kylor, Nu-Way, etc.
Spot Labelers by New Jersey Pony Labelrite, Ermold, World—for any size container and label.
Fully Automatic Labelers by World, Pneumatic Scale and others.

SEND US YOUR INQUIRY
FRED R. FIRSTENBERG, Pres.

FIRST MACHINERY CORP.
209-289 TENTH ST.
BROOKLYN 15, N. Y.
STerling 8-4672

FOR SALE

1—Niagara Model 510-28 type 316 Stainless Steel Filter, 500 sq. ft., with extra set leaves.
3—Fitzpatrick Comminutors, Stainless Steel, models, D, F & K.
3—Rotary Hot Air Dryers, 5'6" dia. x 50' long.
1—Buflovak #6.5 Stainless Steel Double Effect Evaporator—588 sq. ft.
1—Conkey Triple Effect Evaporator, Herculoy tubes—1900 sq. ft.—UNUSED.
2—Davenport 2A Grains Presses.
1—Stainless Steel Spray Dryer, 19' dia. x 20' high.
1—Bowen 5 dia. Stainless Steel Spray Dryer.
1—Overton 24" x 60" Double Drum Dryer —UNUSED.
2—Double Drum Dryers, 24" x 36" drum.
2—Triangle G-2-C Elec-Tri-Pak Weighers and Fillers.
4—Mikro Pulverizers, #2DH, #2-TH, #3-TH.
1—10,500 gal. Horizontal Stainless Steel Tank—UNUSED.
25—Stainless Steel Tanks—30 gal. to 6500 gal.
10—4700 gal. Horizontal Brewery Glass Lined Welded Tanks.
2—14,000 gal. Horizontal Glass Lined Welded Tanks.
25—Stainless Steel and Stainless Clad Steam Jacketed Kettles, 40 gal. to 500 gal.
2—Mojonnier Stainless Steel Vacuum Fillers, model 90.
1—Hope type 18 Semi-Auto Single Piston Filler, St. St., Rising Table, Agitated Hopper.
2—Stainless Steel Selectro Screens, 2' x 7', two-deck, enclosed.

BOTTLING CANNING MACHINERY PERRY SUPPLIES PROCESSING

PERRY EQUIPMENT CORP.

1411 N. 6TH ST.
PHILA. 22, PA.

Phone:
STevenson 4-7210

A BRILL BUY
. . . IS THE BEST BUY

SPECIALS

1—Buflovak #6.5-29-D double effect S/S Evaporator.
1—I. R. 208 ton Jet Refrigeration unit.
1—Buflovak 32"x120" double drum Dryer.
1—Buflovak 6' x 5'6" Monel, single drum Flaker.
1—Link Belt 5'2" x 20' steel Roto-Louvre Dryer.
1—Hersey 18"x12' Hot Air Rotary Dryer 304 S/S.
3—Elmco 18"x24", 18"x12", 316 S/S Rotary Vacuum Filters.
1—Bird 18"x28" solid bowl, Continuous Centrifuges 316 S/S.
1—Sharples P-9-14 Super-D-Canter 304 S/S.
1—Fletcher 20" Suspended type Centrifugal 304 S/S.
4—Sweetland Filters #3, #5, #7, #12.
6—Day "Cincinnatus" Sigma Blade Mixers 600, 200 and 100 gal.
2—Robinson 304 S/S Jacketed Powder Mixers, 90 cu. ft.
1—#2TH Mikro Pulverizer, 15 HP motor.
2—Rotex Sifters 40"x120", 40"x84".

BE BRILL
EQUIPMENT COMPANY

2401 Third Ave., New York 51, N. Y.
OR
4101 San Jacinto, Houston 4, Texas

FOR SALE
30" Copper Coating Pans with stem coils
300 gal. Copper Still with condenser and tank
100 qt. 3 speed Read Master Mixer
80 qt. M-80 4-speed Hobart Mixer
100 gal. Copper Steam Jacketed Mixing Kettle
York Freon Compressor with 1½ HP 3 phase motor
Burns Split Nut Peanut Blancher
SAVAGE BROS. CO.
2836 Gladys Ave. Chicago 12, Ill.

CALL "CONSOLIDATED" FIRST AND SAVE!

3—Shriver 42"x42" cast iron, plate & frame closed del. Filter Presses, 27-1" chambers.
3—Day 15 gal. Pony Mixers, m.d. S.S. cans.
2—Haskins Cap Tighteners, m.d.
1—4TH Mikro Pulverizer 60 HP, tefc.
2—Stainless Steel Hersey Rotary Dryers, 5'x26' and 6'x23'.
2—8'x125' Rotary Kilns.
3—Buflovac 42x120, 32x120 Atmos dbl. Drum Dryers, complete; 1—American 24x36.
2—54"x70" and 1—40"x60" Bird Continuous Centrifugals, S/S Solid bowls.
3—Unused #12 Sweetland FILTERS, 46 bronze monel covered bottom drainage leaves 2" o/c. latest type; 1—#2, 23 copper leaves 1½" oc.
1—Day #30 Imperial jack. Mixer, 75 gal.
1—Buflovac 48"x40" Drum Flaker, chrome plated, s/s ends.
9—Sperry 18x8" Filter Presses, 11 ch.
1—Link-Belt Co. ROTARY DRYER, Roto-Louvre, #502-16 Type C, 5'2" dia. 16' long with #304 S/S contact parts.
5—Horiz. Dry Powder Ribbon Mixers, 4000#, 1500#, 500#.

Our 39th Year
Consolidated Products Company, Inc.
158 Observer Hgway
HOBOKEN, NEW JERSEY
Tel.: HO 3,4435 • N. Y. Tel.: BA 7-0600

At Your Service . . .

The Searchlight Section is at your service for bringing business needs or "opportunities" to the attention of men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industry served by Mc-Graw-Hill publications.

For Sale At Great Savings
MODERN REBUILT MACHINERY

UNION Rebuilt Machinery Established 1913

MIXERS

Day Robinson Dry Powder Mixers and Sifters, from 50 up to 10,000 lbs.
Day, New Era, Hottman Mixers 2 to 3500 gals. with and without Jackets, Single and Double Arm Agitators.
Rotex, Day, Robinson, Gayco, Tyler Hummer, Selectro Sifters.
Barbour-Stockwell 100 gal. Stainless Steel Steam Jacketed Paste Mixer.
Groen 150 gal. Stainless Steel Steam Jacketed Mixing Kettles.
Baker Perkins size 16-X-BB Vacuum Double Arm Steam Jacketed Mixer.

FILLERS & CAPPERS

Filler, Hope, Elgin S.S. Piston Fillers.
Elgin 24-Head Rotary Vacuum Filler.
Resina LC Automatic Capper.
Capem 4-Head Capper.
S. & S. G1, G2, G6, HG88 Auger Fillers.
Triangle Package Models U1, A3, A1C, G2C, A6CA Elec-Tri-Pak Fillers.

WRAPPERS

Stokes & Smith Models B and BB Auger Transwraps.
Doughboy and Pack Rite Automatic Rotary Bag Sealers.
Standard-Knapp No. 429 Carton Sealer.
Hayssen, Package Machy. Co. FA, FA4, DF, CA2, Miller, Scandia and Oliver Automatic Cellophane Wrappers.
Hudson Sharp Campbell Automatic Cellophane Wrappers, Models 2W6, 2W8 and 2W10.
Forgrove Model 26D Foil Wrapper with underneath fold and adjustable jaws.

LABELERS

Burt and Knapp Adjustable Wraparound Labelers.
Pony late style ML Labelrite.

MISCELLANEOUS

Sanders 20HP Meat or Fruit Grinder.
Brown PFM Automatic Bag Filling Machine.
Fitzpatrick "D" S. S. Comminuter.
Mikro 3TH, 3W, 2TH, 1SH Pulverizers.
Charlotte 3 HP Monel Colloid Mill.
Stokes D, DD2 and RBB Tablet Machines.
Colton 2RP and 3RP Rotary Tablet Machines.

Available For Immediate Delivery — Write, Wire, Phone For Details
Act Now For Choice Selection

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York 12, N. Y.

TOP PRICES PAID FOR YOUR SURPLUS EQUIPMENT

FOR SALE

1—TANK, 2,800 GAL. STAINLESS, HORIZONTAL OVAL SHAPE, SANITARY FINISH
1—TANK, 2,200 GAL. STAINLESS, VERTICAL, INSULATED, SANITARY FINISH
1—TANK, 600 GAL. VERTICAL, AGITATED, INSULATED, SANITARY FINISH
1—TANK, 500 GAL. RECTANGULAR, INSULATED, SANITARY FINISH
2—TANKS, 14,000 GAL. GLASS LINED, HORIZONTAL, ALL WELDED
3—TANKS, 23,000 GAL. PLASTIC LINED, HORIZONTAL, ALL WELDED
1—DOUBLE DRUM DRYER, 24" DIA. X 36" LG. DRUMS, ATMOSPHERIC
1—DOUBLE DRUM DRYER, 32" DIA. X 90" LG. DRUMS, ATMOSPHERIC
1—DOUBLE DRUM DRYER, 32" DIA. X 120" LG. DRUMS, ATMOSPHERIC
1—VACUUM PAN, 36" MOJONNIER, 36 SQ. FT. COIL SURFACE, SANITARY, STAINLESS
1—VACUUM PAN, 48" MOJONNIER, 111 SQ. FT. COIL SURFACE, SANITARY, STAINLESS
3—VACUUM PANS, 181 TO 315 SQ. FT. COIL SURFACE, SANITARY, STAINLESS
2—MIXERS, STAINLESS, J. H. DAY CINCINNATUS, 75 GAL. W. C. DOUBLE SIGMA BLADES, JACKETED
2—EVAPORATORS, STAINLESS DOUBLE EFFECTS, 444 AND 588 SQ. FT., SANITARY

BEST EQUIPMENT COMPANY
617 Davis Street Evanston, Illinois
DAvis 8-0926

E.C.H. SPECIALS

Biner Ellison Model 16-Q Filamatic
Resina Capper, twin, 120 per min.
Rotex 40x84" Sifter, 3 deck, 2 hp mtr.
New 74 cu. ft. S/S Spiral Mixer, Immed. Del.
MRM 12 spt. SS Rotary Vacuum Filler
Gemco Blender 20 cu. ft. w/3 hp motor.
Premier 6" SS Colloid Mill 20 hp motor
Capem SIF auto. Capper, up to 88mm.
New SS Sturtevant #7 Rotary Blender
Mikro #4 Pulverizer with 40 HP motor
Wrap around Labelers, All Makes & Sizes

NEW—STEEL & S/S MIXERS, KETTLES, TANKS & DRYERS. Fabricated To Your Specifications. Engineering Advice Available.

WE BUY COMPLETE PLANTS OR SINGLE UNITS
WHAT HAVE YOU FOR SALE?
YOU CAN BANK ON
EQUIPMENT CLEARING HOUSE, INC.
111 33rd Street, Brooklyn 32, N. Y.
SOuth 8-4451—4452—8782

SPECIAL OFFERINGS

MODERN PACKAGING EQUIPMENT

KARL KIEFER 24 Head Fully Automatic, Stainless Steel Vacuum Fillers.
CAPEM 4 and 3 Head Fully Automatic Cappers.
The above machines are in practically new condition.
PNEUMATIC SCALE COMPANY Cartoning Line, Consisting of: Automatic Feeder, Bottom Sealer, Filler, Top Sealer & Compression Unit.
PNEUMATIC SCALE COMPANY Tightwraps, High Speed.
PNEUMATIC SCALE COMPANY, WORLD and PONY fully automatic and semi-automatic Labelers, 60-120 per minute.
HAYSSEN Model 8-11 Cellophane Wrapper, latest type.
STOKES & SMITH Model H.G. 84, G, and GD Auger Fillers.
STOKESWRAP Model A with electric eye, counter, stainless steel auger filler.
Partial List—send for complete list of equipment in stock.

WANTED
PNEUMATIC SCALE Large Liners
All Types of Bottling and Cartoning Equipment
PACKAGE MACHINERY CO. Model FA or FAQ Cellophane Wrappers.
Will Buy Single Machines or Entire Plants

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone, Yonkers 5-0442

Used Mojonnier Filler, Model 90, 14 spouts, rotary vacuum filler and crowner for 12, 16, 24 and 32 oz. bottles. Excellent Condition.

Used 100 gallon stainless steel storage tank with cone bottom. Excellent Condition.

FILPACO INDUSTRIES, INC.
2426 South Michigan Avenue
CHICAGO 16, ILLINOIS

FOR SALE

100 to 300 gal. S.S. Mix Tanks, water jkt.
250 gal. Vert. S.S. Tank, insul., agit.
500 gal. Pfaudler G.L. Tank, jkt., T.C. Coil.
36" & 60" S.S. Vacuum Pans.
125 to 1500 gal. Homogenizers or Viscolizers.
1000 to 3000 gal. Glass Lined Tanks, agit.
3—#10BB-Waukesha Pumps, 1 H.P.
#25BB Waukesha Pump, 1 H.P.
1½" S.S. Centrif. Pumps, 2 H.P.
50 gal. S.S. Premixer (Tank), side agit.
26" Vorciene Centrifugals, copper baskets.
Hobart Grinder, 1½ H.P.
15 H.P. Clayton Steam Generator.
Little Giant Ice Breaker, 1 H.P.
Girdler S.S. Votator, 2 tube.
4x4 & 5x5 Ammonia Compressors.
Milk Pasteurizers, Coolers, Fillers, Washers.
Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
Murray Hill 2-4616

ADVERTISERS IN THIS ISSUE

Alleghany Ludlum Steel Corporation. 141
Allied Chemical & Dye Corporation
National Aniline Division 179
Nitrogen Division 29
Semet-Solvay Petrochemical Div.... 133
Allis-Chalmers Mfg. Co..... 145
American Cyanamid Company 77
American Molasses Company
The Nulomoline Division 184
American Optical Company.....B223
American Spice Trade Association...TL222
Amerio Contact Plate Freezers, Inc... 132
Anderson Bros. Mfg. Co.....TR199
Armstrong Cork Company 45
Aseptic-Thermo Indicator Company... 206
Ashworth Bros., Inc. BR203
Atlas Mineral Products Company..... 144

Bakelite Company
Union Carbide & Carbon Corp.....36-37
Bausch & Lomb Optical Co..... 4
Bliss Company, E. W..... 98
Bowser, Inc. TR205
Buffalo Forge Company..... 112
Buflovak Division
Blaw-Knox Company 138

Cambridge Wire Cloth Co., The..... 131
Canning Machinery Division
Food Machinery & Chemical Corp... 8
Carrier Corporation 165
Cherry-Burrell Corporation 216
Chevrolet Division of
General Motors 92
Chrysler Corporation
Dodge Trucks 217
Clark Door Co. TR225
Clinton Foods Inc. 211
Clipper Belt Lacer Company..... 156
Colorado Fuel and Iron Corporation..BL224
Continental Can Company 196
Cooper Alloy Corporation 152
Corning Glass Works 235
Crane Co. .....Flowsheet 109
Crucible Steel Company of America... 26
Cyclone Fence Dept. Division of
United States Steel Corporation..BR199
Cyclotherm Division
National U. S. Radiator Corp..... 154

Day Company, The J. H..... 195
De Laval Separator Company, The.... 137
Delavan Manufacturing Co. BR224
Distillation Products Industries
Eastman Kodak Company 218
Dodge & Olcott, Inc. 148-149
Dodge Manufacturing Corporation..182-183
Doughnut Corporation of America.... 221
Dow Chemical Company, The..... 41
Dow Corning Corporation 181
Doyle & Roth Manufacturing Co., Inc.. 140
Drehmann Paving & Flooring Co.
BC205, BR207
Ducan Company, The 128
du Pont de Nemours & Co., (Inc.), E. I.
Finishes Division 43

Electric Auto-Lite Company, The...TR201
Exact Weight Scale Co., The..... 143

Falk Corporation, The 40
Firmenich Incorporated 170
Food Machinery & Chemical Corp.
Canning Machinery Division 8
Forest Products Division
Olin Mathieson Chemical Corp..... 111
Foxboro Company, The 220
Frick Co. TR203
Fritzsche Brothers, Inc. 129
Fuller Company, The
Pull-out Flowsheet 108

Gas Atmospheres, Inc. 168
Gaylord Container Corporation. Third Cover
General American Trans., Corp.
Tank Car 6
Globe Woven Belting Co., Inc..... 171
Goodrich Company, The B. F.
B. F. Goodrich Industrial
Products Company 20
Gottscho, Inc., Adolph BL202
Griffith Laboratories, Inc., The..... 46
Gustin-Bacon Manufacturing Company. 130

Heyden Chemical Corporation 208
Hoerner Boxes, Inc. 155
Hoffmann-La Roche, Inc. 162
Hope Machine Company 227
Hudson-Sharp Machine Co. 135
Huron Milling Company, The.....176-177

Ingersoll-Rand 180
Ingredients for the Food Processor.... 229
Inland Steel Container Company..... 228
International Minerals & Chem. Corp.
Ac'cent • International Division..BR225
International Salt Co., Inc..... 31

Jamison Cold Storage Door Co..... 126
Jenkins Bros. 42
Jesse Jones Box Corp. BR226
Johns-Manville
Celite Filter & Pressing Aids
Flowsheet 103
Jones & Laughlin Steel Corporation.... 10

Kelco Company, The 167
King Co. of Owatonna, The.....TR223
King Zeero Company, The.....T226
Klenzade Products, Inc. 160

Ladish Co., Tri-Clover Division..... 124
Langsenkamp Co., F. H.....TL223
La Porte Mat & Mfg. Co.....TR207
Lee Metal Products Co., Inc..... 164
Link-Belt Company 39
Lunkenheimer Company, The 166

Marley Company, The 209
Master Electric Company, The..... 161
Mathews Conveyor Company..... 187
Minneapolis-Honeywell Regulator Co.
Industrial Division 14-15
Monarch Mfg. Wks., Inc..... 192
Mosaic Tile Company, The..... 83

Nash Engineering Company 44
National Aniline Division
Allied Chemical & Dye Corporation.. 179
National Pipe and Tank Co..... 229
Neptune Meter Company 172
Niagara Blower Company 188
Nicholson & Company, W. H..... 174
Nitrogen Division
Allied Chemical & Dye Corporation. 29
Norda, Inc. 17
Nutritional Research Associates..... 229

Oakite Products, Inc. 175

Palmer Thermometers, Inc. 147
Patterson-Kelley Co., Inc., The..... 122
Pfaudler Co., The 16
Pfizer & Co., Inc., Chas.....34, 101
Philadelphia Gear Works, Inc..... 204
Philadelphia Quartz Company.....BC207
Pitney-Bowes, Inc. 97
Pittsburgh Corning Corporation 27
Pneumatic Scale Corp., Ltd.....T224
Powell Valves 142
Proctor & Schwartz, Inc. 90
Pulverizing Machinery Division
Metals Disintegrating Co., Inc..... 30

SALES REPRESENTATIVES

ATLANTA 3.....William H. Kearns
801 Rhodes-Haverty Bldg....Walnut 5778
BOSTON 16.....Paul T. Fegley
350 Park Square Bldg..Hubbard 2-7160
CHICAGO 11.....Lockwood B. Seegar
520 N. Michigan Ave.
Harvey W. Wernecke..Mohawk 4-5800
CLEVELAND 15.....Tom E. Taylor
1510 Hanna Bldg.....Superior 1-7000
DALLAS 1.....Douglas Billian
1020 Adolphus Tower Bldg. Gordon Jones
Prospect 7-5054
DETROIT 26.....Lockwood B. Seegar
856 Penobscot Bldg.....Tom E. Taylor
Woodward 2-1793
LOS ANGELES 17.....Peter B. Carberry
1125 West 6th Street.....Madison 6-9351
NEW YORK 36.....Paul T. Fegley
330 West 42nd St....Frank W. McCarthy
Longacre 4-3000
PHILADELPHIA 3.....Edward A. Martin
Architects Bldg.....Rittenhouse 6-0670
PITTSBURGH 22.....Edward A. Martin
818 Oliver Bldg.....Atlantic 1-4707
SAN FRANCISCO 4...William C. Woolston
68 Post St.....Douglas 2-4600
ST. LOUIS 8.....Lockwood B. Seegar
Continental Bldg.....Lucas 4867
LONDON E. C. 4, ENGLAND.....H. Lagler
93 Farringdon Street
PARIS 8, FRANCE.....S.P.I.C.
5, Avenue George V.....Dept. Etranger

Quaker City Cold Storage Co., Inc..... 229

Reeves Division
Reliance Electric & Engineering Co.. 139
Rem-Cru Titanium, Inc. 134
Republic Steel Corporation 32-33
Riegel Paper Corporation 151
Rosenthal Packing Company 189
Ryerson & Son, Inc., Joseph T.....BR205

Sarco Company, Inc. 120
Seaplant Chemical Corporation 21-23
Semet-Solvay Petrochemical Division
Allied Chemical & Dye Corporation. 133
Shell Chemical Corporation 25
Shippers' Car Line Corporation..... 115
Shuttleworth Machinery Corp. 84
Simplicity Engineering Company 194
Spraying Systems Co. BL226
Staley Manufacturing Company, A. E.. 12
Standard Oil Company (Indiana)
Flowsheet 110
Standard Steel Corporation TL202
Sterwin Chemicals Inc.
Roccal Division .....Second Cover
Stewart Warner Corporation 19
St. John & Co. 89
Stokes & Smith Co. 153
Strahman Valves, Inc. BL222
Sturtevant Mill Company 35
Sugar Information, Inc. 116

Taylor Instrument Companies.....158-159
Trent Tube Company 190-191
Triangle Package Machinery Co..... 210

Union Asbestos & Rubber Company... 24
Union Carbide & Carbon Corporation
Bakelite Company 36-37
United States Gasket Co..... 193
United States Rubber Company
Footwear Division 212
Mechanical Goods Division 219
United States Steel Corporation
Cyclone Fence Department BR199
U. S. Steel Products Division..... 169
U. S. Stoneware Company, The..... 173

Van Ameringen-Haebler, Inc..Fourth Cover
Viking Pump Company BR201
Virginia Gear & Machine Corp..... 204

Wallace & Tiernan Incorporated..... 136
Walworth Company 38
Washington Steel Corporation 78
Waukesha Foundry Company 28
Waxed Paper Merchandising
Council, Inc. 157
West Disinfecting Company 186
Western Condensing Company 48
Western Waxed Paper Division
Crown Zellerbach Corporation 213
Westinghouse Electric Corporation
Sturtevant Division 47
Weston Electrical Instrument Corp.... 215
Wheeler Manufacturing Co., C. H..... 185
Where To Buy 229
Where to Store Frozen Foods..... 229
Wickwire Spencer Steel Div. of CF&I..BL224
Wirt & Knox Mannufacturing Co..... 178

Yale & Towne Mfg. Co., The..... 236
Yarnall-Waring Company 18

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

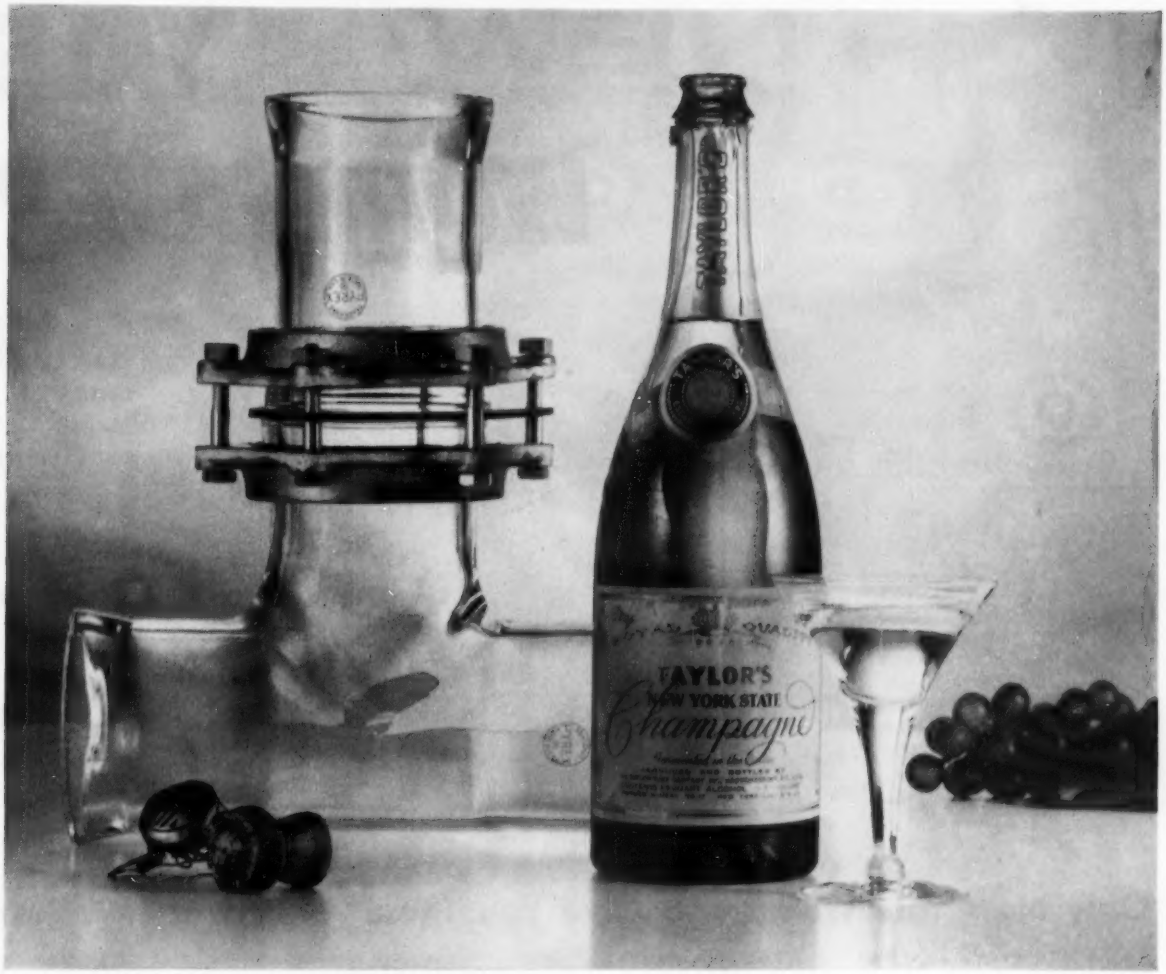
EMPLOYMENT OPPORTUNITIES...230, 231

BUSINESS OPPORTUNITIES 231

EQUIPMENT
(Used or Surplus New).....231-233

ADVERTISERS INDEX

Allied Equipment Co..... 233
Best Equipment Co., Inc..... 233
Brill Equipment Co..... 232
Burnham & Morrill Co..... 231
Consolidated Products Co., Inc..... 231
Drake Personnel Inc..... 230
Equipment Clearing House Inc..... 233
Filpaco Industries Inc..... 233
First Machinery Corp..... 232
Food Machinery & Chemical Corp..... 231
Kehoe Machinery Corp..... 233
Loeb Equipment Supply Co..... 231
Machinery & Equipment Corp., The..... 231
Newman, Irwin E..... 231
Perry Equipment Corp..... 232
Rich & Morgan Inc..... 231
Savage Bros., Co..... 232
Union Standard Equipment Co..... 233



FLAVOR PROTECTION *made easy*

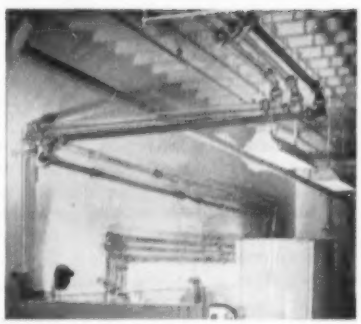
Taylor wine makers take what nature has accomplished, ferment it, and bottle it as some of the finest wines you can enjoy.

Once they were greatly concerned with the corrosive action of fruit acids in their pipelines. Corrosion threatened the clarity of the wines. Former corrosion prevention methods were expensive.

Then, 26 years ago, Taylor installed some pipe made of PYREX brand glass No. 7740. They found it impervious to acid attack. And it protected clarity even beyond their expectations.

That's because hard PYREX pipe is so easy to clean thoroughly. Today grape juice and wine travel 1½ safe miles through glass pipe, further than many of the grapes travel from the vineyard to the winery. The original pipe, vintage 1930, is still as good as new.

If you want protection from corrosion and contamination and freedom from difficult cleaning, your PYREX pipe distributor can give them to you. Other food processors already enjoy them. You can, too. Write us for your distributor's name. He'll give you more facts.



These 2" PYREX pipelines are part of a 1½ mile system at Taylor Wine Company, Hammondsport, N.Y.

CORNING GLASS WORKS, CORNING, N. Y.
55 CRYSTAL STREET

Corning means research in Glass

For more data, circle this page number on card at back →

NEW YALE *WORKSAVER* packs plenty of power in only 24"

Only New Yale *Worksavers* Give You These 4 Big Advantages:

• **High maneuverability**—New Yale *Worksaver*, equipped with a shorter battery compartment, is only 24" longer than the load, leaving more room to maneuver in narrow aisles, other tight areas.

• **More power**—The short battery compartment accommodates a high-capacity (6-cell, 13-plate) battery to give you adequate power for an 8 hour operation without recharging. For handling operations with extra-heavy power requirements, specify the same Yale *Worksaver* with a 6-cell, 25-plate battery.

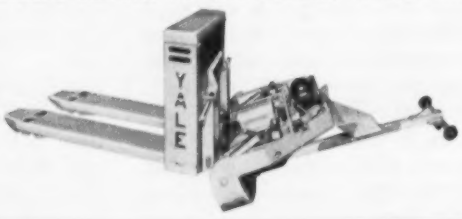
• **Maximum load stability**—Twin vertical lifting cylinders provide load rigidity. Wide-spread, dual-type wheels in each fork assure better load distribution... make turning easy and safe.

• **Greater underclearance**—Compression tubes, used for lifting, are mounted high in the forks... provide never less than 5" pallet fork underclearance in raised position. Front-end underclearance always remains 3" whether the forks are in raised or lowered postion, making rampwork easy with the new Yale *Worksaver*.

In addition, new Yale *Worksavers* include many time-tested features—such as automatic time-delay between speeds for smooth acceleration, dual-acting braking system for controlled braking action, ball-bearing steering and push-button lifting for greater ease of operation. With new Yale *Worksavers* on the job, you are *assured* of smoother, faster and safer handling at less cost. Available in 4,000 and 6,000 lb. capacities with either short or long battery compartment. For full facts, write The Yale & Towne Mfg. Co., Philadelphia 15, Pa., Dept. 465.

EXCLUSIVE YALE "BREAKAWAY" FEATURE SIMPLIFIES MAINTENANCE.

By simply removing two pins the entire front compartment swings open. Every mechanical and hydraulic unit becomes accessible for quick and easy maintenance.



YALE*

*REG. U.S. PAT. OFF.

INDUSTRIAL LIFT TRUCKS AND HOISTS

Gas, Electric, Diesel & LP-Gas Industrial Trucks • *Worksavers* • Warehousers • Hand Trucks • Hand and Electric Hoists

FOOD ENGINEERING READER SERVICE

For Food-Plant Employees and Consultants Only

Use this POSTAGE-FREE CARD to . . .

1. get more information on products advertised or described in New Equipment, New Packages, or Just Off the Press
2. subscribe to FOOD ENGINEERING
3. order reprints offered in this issue
4. notify us of a change of address

Product Index on other side

FOR PRODUCT INFORMATION

1. Circle page numbers at right. Suppliers will reply direct to you. No obligation. →

IMPORTANT—FOR PAGES SHOWING MORE THAN ONE ADVERTISED ITEM, USE THIS GUIDE TO NUMBERS ON CARD.

21-2-3 All items shown
21-2-3a SeaKem stabilizers info.
21-2-3b Milk puddings info.
21-2-3c Starting formula for chiffon
21-2-3d SeaKem bul. 142
21-2-3e Gel strength bklt.
21-2-3f Colloids out of the sea
21-2-3g SeaKem mailing list
32-3 All items shown
32-3a Enduro steel info.
32-3b Enduro barrels & drums info.
32-3c Electrunite piping info.
32-3d Titanium info.
35 All items shown
35a Micronizer bul.
35b Food-grinding buls.
35c Conveyor bul.
35d Blending bul.
35e Separators bul.
36-7a Processed foods bklt.
36-7b 1956 guide to packaging
45 All items shown
45a Armaglas insulation bk.
45b Insulation selection bk.
45c Insucolor coatings bk.
45d LT cork covering bk.
84a Can unscrambler bk.
84b Can crate unloader bk.
89a Neotread bul. D.
89b Hand truck info.
135a Campbell wrapper brochure
135b Campbell-pak lit.
136a Bul. 2136-C
136b Best weighs bul.
138a Kettles info.
138b Process equip. info.
152a Valve clinic info.
152b Bul. VP 561
176-7a MSG info.
176-7b HVP
183a Bul. A634
183b Bul. A644
183c Bul. A606
194a Simplicity screens info.
194b Vibrating conveyors info.
199a Bul. 5-10
199b Metal belt info.
201a Temperature indicators cat.
201b Sanitor pump cat.
202a Hersey dryer cat.
202b Code-Dater lit.
203a Refrigeration lt.
203b Cat. OMC-56
205a Meters & filters cat.
205b Proportioners & blenders cat.
205c Fillers & packagers cat.
205d Bul. JE
205e Steel cat.
207a Belt cat.
207b Cleaning in food industry
207c Bul. JE
212a Raynsters cat.
212b Royal footwear cat.
218a Myverol - monoglycerides info.
218b Vitamin A info.
222a Natural spice info.
222b Nozzles info.
223a Can opener
223b Product kooler
223c AQ hand refractometer
224a Food packaging info.
224b Wissco belts
224c Cat. 32
225a Prest-O-Matic info.
225b Accent info.
226a Ice water systems
226b Cat. 24

TO ENTER SUBSCRIPTION

2. Use this form. We'll bill you later. →

TO ORDER REPRINTS (P. 192)

3. Circle numbers, give quantity. We'll bill you. →

TO CHANGE ADDRESS

4. Print your OLD address here. →

CIRCLE PAGE NUMBERS BELOW, FILL IN OTHER SIDE, MAIL.

ADVERTISEMENTS

For pages showing more than one advertised item, use guide at left.

2	25	36-7b	89b	131	181	173	190-1	206a	221
6	26	38	90	132	182a	174	192	206	222a
8	27	39	92	133	182b	175	193	207a	222b
10	28	40	97	134	183	176-7a	194a	207b	223a
12	29	41	98	135a	184	176-7b	194b	207c	223b
14-5	30	43	103	135b	185	178	195	208	223c
16	31	45	108	136a	186	179	196a	209	224a
17	32-3	45a	109	136b	187	180	196b	210	224b
18	32-3a	45b	110	137	188-9	181	201a	211	224c
19	32-3b	45c	111	138a	190	182	201b	212a	225a
20	32-3c	45d	112	138b	191	183a	202a	212b	225b
21-2-3	32-3d	46	115	139	194	183b	202b	213	226a
21-2-3a	34	47	116	140	195	183c	203a	215	226b
21-2-3b	35	48	120	141	196	184	203b	216	227
21-2-3c	35a	77	122	142	197	185	204	217	228
21-2-3d	35b	78	124	143	198	186	206a	218a	235
21-2-3e	35c	83	126	144	199	187	206b	218b	236
21-2-3f	35d	84a	128	145	170	188	206c	219	237
21-2-3g	35e	84b	129	147	171	189	206d	220	238
24		36-7a	89a	130	148-9	172			

EDITORIAL

These numbers correspond to numbers in text.

70A	73F	79C	117A	128B	144A	218D	221M	222Q	227C
70B	73G	79D	117B	131A	144B	218E	221N	222R	227D
70C	74A	79E	118A	132A	150A	218F	221O	222S	227E
70D	74B	80A	118B	132B	150B	218G	221P	225A	227F
70E	74C	80B	119A	135A	152A	218H	221Q	225B	227G
70F	74D	80C	119B	135B	152B	218I	221R	225C	227H
71A	74E	80D	119C	136A	152C	218J	222A	225D	227I
71B	75A	80E	121A	139A	152D	218K	222B	225E	227J
71C	75B	80F	121B	139B	152E	218L	222C	225F	227K
71D	75C	80G	121C	139C	152F	218M	222D	225G	227L
71E	75D	81A	123A	140A	152G	221A	222E	225H	227M
71F	75E	81B	123B	140B	152H	221B	222F	225I	227N
72A	75F	81C	123C	140C	1521	221C	222G	225J	227O
72B	75G	81D	125A	140D	154A	221D	222H	225K	227P
72C	76A	81E	125B	140E	154B	221E	222I	225L	227Q
72D	76B	81F	125C	140F	154C	221F	222J	225M	227R
72E	76C	81G	125D	140G	154D	221G	222K	225N	227S
72F	76D	82A	127A	140H	154E	221H	222L	225O	227T
73A	76E	82B	127B	140I	155A	221I	222M	225P	227U
73B	76F	82C	127C	140J	218A	221J	222N	225Q	227V
73C	76G	82D	127D	143A	218B	221K	222O	227A	227W
73D	79A	82E	128A	143B	218C	221L	222P	227B	227X
73E	79B	82F							

☐ 1 yr. $2 ☐ 2 yrs. $3 ☐ 3 yrs. $4 Domestic rates only, for others, see p. 5

Product or Service..... No. Employees In Your Plant

8	9	10	11	12	13	14
☐	☐	☐	☐	☐	☐	☐

OLD ADDRESS

No. & Street.....

City..... State .....

HERE'S WHAT'S IN THIS ISSUE

Air-cond. equip. 47, 112, 140, 165, 221
  Compressors 44
  Cooling towers 209
Air eliminators 218
Air pumps 218, 221
Algin 167
Ammonia 29
  Systems 165
Antibiotics 77, 227
Anti-foam agents 181
Ascorbic acid 101
Bags 152
Bag makers 76, 80
Bag openers 79
Barrels 32-3
Bearings 182
Belts 20, 171
Chain 39
Colored 219
Lacers for 156
Metal 131, 199
  203, 207, 222, 224
Bins 81
Blenders 35, 122
Bottling equip. 224, 225
  Cleaners 76
  Labelers 72
  Washing 144
Boxes 81, 125
  154, 155, 237
  Impregnated 25
Breaders 221
Brine equip. 31
Bundlers 71
Can closers, coffee 127
Can-handling equip. 84
  Openers 223
Can-making equip. 98
Cappers 73, 74
Cartoners 74
Centrifuges, pilot 227
Chemicals 225
Chlorinators 136
Clamps, hose 140
Cleaning equip. 128, 160, 227
  Bottle 76
  Hose reels 178
  Nozzles 192, 222
Cleaning material 2
  175, 207, 227
Clothing, protective 212, 222
Clutches 183
Colloids 21-2-3, 167
Colors, certified ...179, 227
Compressors ...44, 218, 221
Computers
  Electronic 227
  Seminars on 227
Containers 150
  Boxes 81, 125
    154, 155, 237
  Cans 196
  Can sleeves 152
  Impregnated 25
  Plastic 152
  Steel 10, 32-3
    117, 169, 196, 228
Controls ..14-5, 158-9, 205
  Ratch 136
  Cook 206
  Counters 81
  Filling 70
  Flow ..123, 172, 220, 221
Moisture 225
Refractometers 4
  118, 223, 227
Samplers 119, 227
Speed drive 82
Temperature 147
  201, 215
Testers 221
Weight 82
  121, 143, 225
X-Ray 125
Conveyor equip. 35, 121
  135, 183, 187, 222
Bearings 182
Belts 20, 131
  171, 203, 207, 224
Bucket 222
Can handlers 84
Chain 39
Coders 75
Colored belts 219
Guide rails 193
Metal belts 199
Pneumatic 108
Pneumatic feeds 30
Portable 222
Safety controls 119
Trolley 222
Unloaders 125
Vibrating 81, 194
Cooling towers 209
Cork 45
Counters 81
Couplings 40, 221
Cutters, tube 221
Defoamers 181
Design, miniaturization..218
Docks, adjustable 132
Dollies 140
Doors 225
  Cold storage 126
Drums 10, 32-3
  117, 169, 228
Dryers 90, 128, 202
Electrical equip.
  Insulation 222
  Sealed plugs 222
Electronic equip.
  Computers 227
  Counters 81
  Maintenance of 221
  X-Ray gauges 125
Emulsifiers 227
Esters, fatty acid 227
Fans 112, 140, 221
Fasteners, belt 156
Feeders 136
  Pneumatic 30
  Vibrating 81
Fillers ...8, 70, 71, 73, 76
  79, 153, 210, 225, 227
  Cup 199
Filters 103
Flavors ...17, 46, 129, 140
  148-9, 170, 227, 238
  Brewed coffee 227
  Solvents 41
Floors 144
  Drains 221
  Tile 83
Flour, enrichment of 227
Foil 154
Footwear, protective 212
Forms, printed 227
Furniture, office 221
Gages, dimension 221
Gelling agents 21-2-3
Generators
  Gas 168
  Steam 154
Glass 27, 227, 235
Grease collectors 218
Grinders 35
Heat exchangers ..137, 218
Hose, reels for 178
Imprinters 75, 97
Incinerators 221
Insecticides 186
Insulation, .27, 45, 130, 143
  Pipe 127
  Tape 222
Keg equip., de-bungers..132
Kettles 138, 164
Labelers 72, 75, 121
Laboratory equip. 225
  Glassware 227
  Heat sealers 80
  Homogenizers 227
  Moisture testers 225
  Ovens 225
Lactose 48
Lecithin 12
Lockers 221
Lubrication ...19, 110, 221
Materials handling 218
Meats, pre-cut 189
Metal
  Expanded 144
  Preservation of 139
  Stainless steel 26
    32-3, 78, 141
Steel 205
Titanium 32-3, 134
Milk meters 221
Mixers 127, 195, 204
Monoglycerides 218
Monosodium glutamate 12
  176-7, 225
Motors ..117, 135, 145, 161
Mountings, vibration 222
Nozzles ..192, 222, 224, 226
Oil, corn 12, 211
Outserters 16, 80
Packaging equip. ..79, 80, 82
  127, 135, 152
  205, 224, 225
Bag makers 76
Bundlers 71, 225
Cappers 74
Cartoners 74
Casers 82
Counters 81
Fillers ..8, 70, 71, 73, 76
  79, 153, 199
  210, 225, 227
Guide rails 193
Impregnated 25
Imprinters ..75, 97, 202
Labelers 72, 75, 121
  225
Outserters 16, 80
Strappers 71
Tube sealers 80
Packaging material..111, 151
Plastic 36-7, 133
  150, 152
Plasticizers 34
Tape 140
Waxed paper ...127, 157
  213, 225
Pails 10
Paint
  Mildew resistant..43, 139
Pallets 81
Pans, plastic 140
Paper 111, 151, 225
  Waxed 157, 213
Pasteurizers 137
Pipe & Tubing 38, 42
  Fittings 169
  Glass 235
  Insulation of 45, 127
    130
  Nozzles 192, 222
  Pipe strainers 221
  Plastic 173
  Stainless 32-3, 124
    190-1
Tube cutters 221
Plastics 133, 140, 152
  Bags 76
  Colored 150
  Compounds 152
  Film 36-7, 154
  Laminate 218
  Plasticizers 34
  Seals 222
  Suppliers of 225
Plugs, electrical,
  waterproof 222
Preservatives ..77, 208, 227
  Beverage 161
Printing 227
Process equip. 32-3, 137
    138, 164
    205, 218
  Agglomerators 119
  Blenders 35, 122
  Breaders 221
  Dissolvers 140
  Dryers 90, 202
  Fruit 227
  Heat exchangers 218
  Leasing of 227
  Meat boilers 140
  Mixers 127, 195, 204
  Pulverizers 35
  Screens 194
  Spray dryers 128
  Tanks 216
Propylene glycol 41
Proteins, vegetable 176
Pulverizers 35
  Feeds 30
Pumps 28, 42
    124, 152, 180
    201, 218, 221
  Air 218, 221
  Air conveyor 168
  Fire 221
  Sump 143
Racks 141
Radios, in-plant 222
Reducers 139, 218
Refractometers 4, 118, 223, 227
Refrigeration 140, 165
    185, 188, 203, 223
  Ammonia 29
  Compressors 221
  Cooling towers 209
  Doors 126, 225
  Freezers 132
Insulation ...27, 45, 143
Truck 24, 131
    140, 227
Water chillers 226
Relish, stabilizers 21-2-3
Research 227
Rings, plastic 222
Roof coatings 139
Rope, wire 222
R.R. cars
  Piggy-back 227
  Tank 6, 115
  Unloaders 125, 222
Salt 31
Samplers
  Bacteria 136
  Liquid 119, 227
Sanitation 2, 128, 160
    175, 178, 186, 207
  Bacteria kit 136
  Bottle 76, 144
  Equipment 227
  Floor drains 221
  Hands 227
  Nozzles 192, 222
  Screens 194
  Soap dispensers 222
  Swabs 125
  Sweepers 123
  Waste disposer 82
Scales 70, 82
    121, 143, 225
Seasonings ...46, 148-9, 227
Separation equip. 35
  Centrifuges 227
  Screens 194
  Strainers 218
Signs, decal 227
Silicones 181
Slings, wire rope 222
Soap dispensers 222
Sodium benzoate 208
Soldering iron,
  self-heating 222
Solvents
  Flavor 41
  Recovery of 218
Spices 46, 222
Stabilizers 21-2-3
Stacks, refractory 218
Staples 225
Starch 12, 211
Steam
  Generators 154
  Traps 18, 120, 174
Stencils, typed 227
Storage equip. 221
Strainers, pipe 221
Strappers 71
Surfacing materials 139
    144
  Insulating 45
  Joint filler 205, 207
  Paints 43
  Tile 83
Sweeteners 12, 48
    116, 184, 211
Tanks 164, 216
  R.R. cars 6, 115
Tape 140
  Insulating 222
Thermometers 147, 201
    215
Thiamine 162
Thickening agents 21-2-3
    167, 227
Tile 83
Titanium 134
Tools
  Nut-running 222
  Tube-working 222
Transmission equip. 183
  Bearings 182
  Couplings 40, 221
  Reducers 139, 218
  Speed controls 221
Traps, steam ...18, 120, 174
Trays, sealed 152
Trucks
  Bodies 227
  Commercial 92, 123
    217
  Dock lift 132
  Hand 89
  Industrial 118, 222
    230
  Name decals 227
  Plant radios for 222
  Plant sweepers 123
  Refrigeration 24, 140
    131, 227
Valves ...38, 42, 169, 124
    140, 142, 152, 166
  Ball-type 221
  Control 220
  Plastic plug 128
Vitamins 162, 218, 227
Water, treatment of 136
    218
Waste, disposal of 82
Wheels & Casters 89

MAIL CARD FOR MORE INFORMATION

PLEASE TYPE OR PRINT—GIVE COMPLETE INFORMATION

Name .....

Position ..... Product .....

Company .....

Street .....

City ..... State .....

May, 1956 Card expires August, 1956

BUSINESS REPLY CARD

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4¢ POSTAGE WILL BE PAID BY—

FOOD ENGINEERING

READER SERVICE DEPARTMENT

330 WEST 42nd ST.

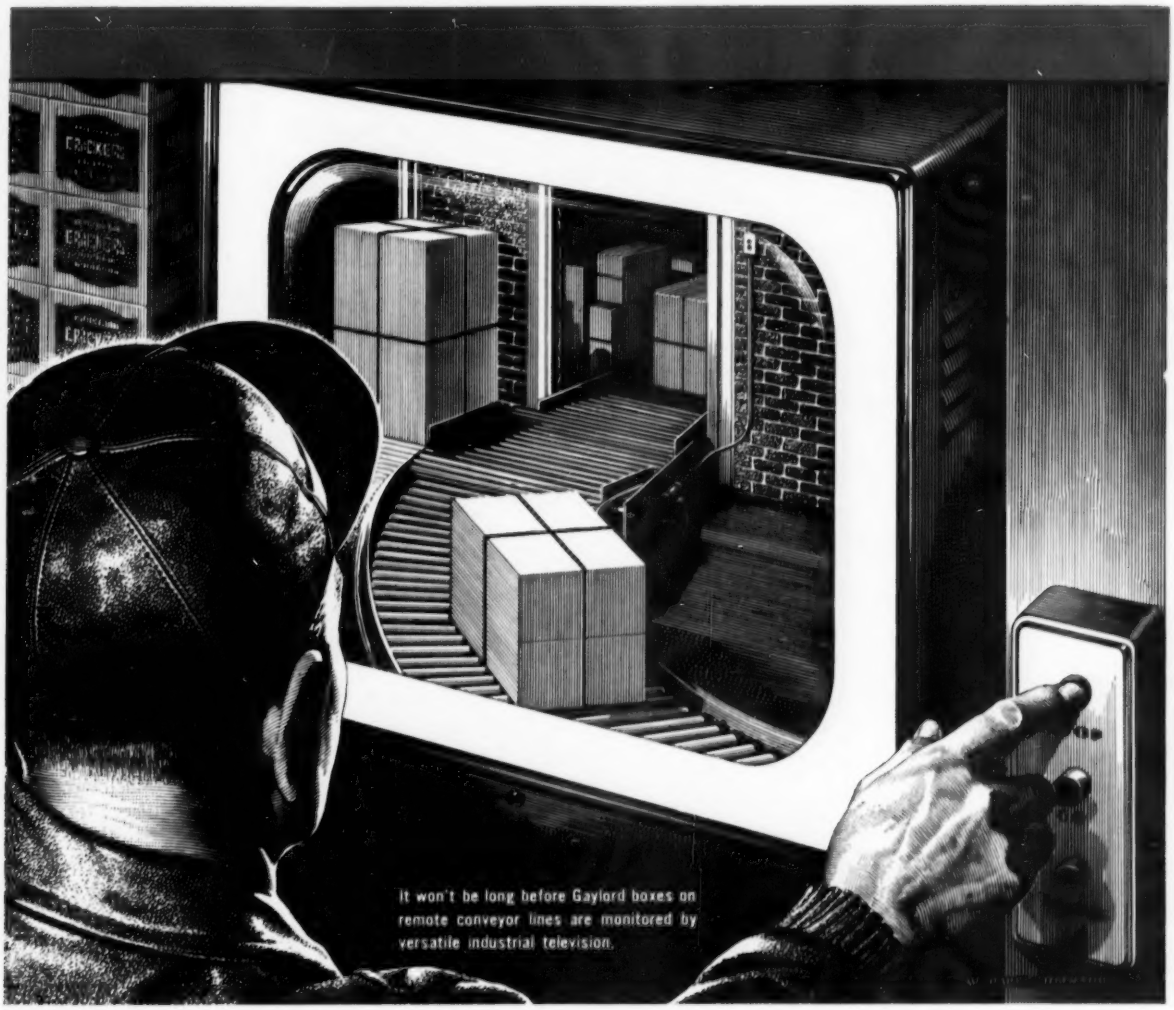
NEW YORK 36, N. Y.

FIRST CLASS

(Sec. 34.9 P.L.&R.)

PERMIT No. 64

NEW YORK, N. Y.



It won't be long before Gaylord boxes on remote conveyor lines are monitored by versatile industrial television.

WELL-BEHAVED BOXES...

Gaylord Boxes

...are vital to modern, mechanized handling methods. As operations become more automatic, interruptions are more costly. Precision-built Gaylord containers are dimensionally accurate and structurally strong to speed packing and handling... prevent jam-ups.

Gaylord container specialists will be glad to work with you in selecting or developing "well-behaved boxes"... for maximum manpower-saving efficiency. Call your nearby Gaylord office.

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

THE Sealva STORY OF "Sealed-In" Flavors

Some years ago, van Ameringen-Haebler, Inc. developed and introduced SEALVA Flavors, the first truly hermetically "sealed-in" high quality dry flavors. This new technique in flavor-making was immediately recognized and enthusiastically accepted by the food industry.

Since those early days, continuing improvements in sealing agents and drying techniques plus the basic superiority in the quality of the natural or imitation flavors themselves, have combined to maintain SEALVA's place as the ultimate in fully protected quality flavors.

What can SEALVA do for your product?

The adoption of SEALVA Flavors makes possible the use of absolute top quality flavor in dry mixes, because the finest of flavors are fully protected in their powdered form against the ravages of deterioration caused by evaporation, oxidation, extended shelf-life, and they are practically impervious to chemical reaction with other ingredients in a mix or compound.

Where can SEALVA Flavors be used to advantage?

SEALVA Flavors are ideal in any relatively dry, powdered, grained, or flaked mixture to insure inert flavor retention in such products as cake mixes, gelatin desserts, cereals, drink powders, pudding mixes, dairy mixes, ice cream mixes, candies (pressed wafer), pharmaceuticals, proprietaries, oil emulsions, etc.

For better flavor we ask you to investigate SEALVA Flavors before you make your final decision on this most important ingredient.

We are prepared to give you suggestions as to the methods of readily evaluating "sealed-in" flavors for your particular product and also will be happy to assist with technical recommendations for the application of SEALVA Flavors to improve your product. Literature and adequate samples are available.

Alva FLAVORS

VAN AMERINGEN-HAEBLER, INC.
521 WEST 57th STREET, NEW YORK 19, NEW YORK